

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 C1  
Edition : 17.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 075 958  
Injection pump  
Pump designation : PES5M55C320RS158-1  
EP type number : 0 410 055 979  
Governor  
Governor design. : RSF340/2300M64-3  
Governor no. : 0 420 021 101

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM602A

1st version kW : 92.0  
Rated speed : 4600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)  
Rack travel in mm : 20.00...22.00

A01

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,4...13,8)  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:



Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP\ 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 F6  
Edition : 17.02.89  
Replaces : 02.06.87  
Test oil : ISO-4113

Combination no. : 0 400 075 959

Injection pump  
Pump designation : PES5M55C320RS166  
EP type number : 0 410 055 980  
Governor  
Governor design. : RSF340/2300M64-1  
Governor no. : 0 420 021 050

Customer-spec. information  
Customer : DB-PKW

Engine : OM602A

1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

A04

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.8)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,10...8,50

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 315  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.50  
Speed rpm : 525...625  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1600  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 2200  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 31.0...35.0  
1000 s: (30.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 5.0...6.0  
1000 s: (4.0...8.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,4...13,8)  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

3.310 V must be attained.

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

#### Testing and adjusting the control-rod-travel sensor with evaluation circuit

##### R2.1.3

##### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095 \dots 2.105$  (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 2,5 F  
Edition : 17.02.89  
Replaces : 30.03.87  
Test oil : ISO-4113

Combination no. : 0 400 075 961

Injection pump  
Pump designation : PES5M55C320RS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M67  
Governor no. : 0 420 021 094

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

### TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

A07

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

### FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

### RATED SPEED

#### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,90...8,30

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

### SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

### LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 350

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[illegible]

LOW IDLE

## SETTING PNEUMATIC FAST IDLE (FLA)

```
Speed          rpm      : 400
Rack travel in mm : (5,7...7,3)
Del.quantity cm3/ : (6,0...14,0)
              1000 s : -
Vacuum         hPa      : 400
```

Remarks:

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^{\circ} \dots 19.7^{\circ}$   
( $19.2 \dots 19.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular  
displacement of cam

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 350$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)  
Control lever on full-load stop. At  $n = 1000$  min.

I = 2.5 A, difference in delivery referenced to delivery (8.8...10.8) ccm/1000 strokes.

A08

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 F8  
Edition : 17.02.89  
Replaces : 26.08.87  
Test oil : ISO-4113

Combination no. : 0 400 075 974

Injection pump  
Pump designation : PES5M55C320RS162  
EP type number : 0 410 055 983  
Governor  
Governor design. : RSF340/2300M60-5  
Governor no. : 0 420 021 063

Customer-spec. information  
Customer : DB

Engine : OM602-LVP MJ:86

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

in. -1 BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

AD9

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,1...7,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315





greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEP 1077 =  $17.3^\circ \dots 17.7^\circ$

( $17.2 \dots 17.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 H6  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 975  
  
Injection pump  
Pump designation : PES5M55C320RS159  
EP type number : 0 410 055 985  
Governor  
Governor design. : RSF350/2300M56-2  
Governor no. : 0 420 021 055

Customer-spec. information  
Customer : DB

Engine : OM602-LVP

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 350



Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $18.3^{\circ} \dots 18.7^{\circ}$   
( $18.2 \dots 18.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 H7  
Edition : 17.02.89  
Replaces : 22.04.88  
Test oil : ISO-4113

Combination no. : 0 400 075 977

Injection pump  
Pump designation : PES5M55C320RS159  
EP type number : 0 410 055 985  
Governor  
Governor design. : RSF340/2300M50-1  
Governor no. : 0 420 021 042

Customer-spec. information  
Customer : DB

Engine : OM602-LVP

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.0...7.4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315



Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $18.3^{\circ} \dots 18.7^{\circ}$   
( $18.2 \dots 18.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular  
displacement of cam

TESTING PNEUMATIC SHUTOFF DEVICE  
-Control lever at idle stop.  
With  $n = 315 \text{ 1/min.}$  and  $p_u = 450 \text{ mbar}$ ,  
control rod must move quickly to  
control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 D  
Edition : 08.03.89  
Replaces : 04.86  
Test oil : ISO-4113

Combination no. : 0 400 075 979

Injection pump  
Pump designation : PES5M55C320RS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF340/2300M59-8  
Governor no. : 0 420 021 051

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0,0...1,0

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315





# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 C  
Edition : 17.02.89  
Replaces : 04.86  
Test oil : ISO-4113  
  
Combination no. : 0 400 075 980  
  
Injection pump  
Pump designation : PES5M55C320RS158  
EP type number : 0 410 055 986  
Governor  
Governor design. : RSF340/2300M64-1  
Governor no. : 0 420 021 050

Customer-spec. information  
Customer : DB

Engine : OM602A

1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

A20

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 315  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 220  
Minimum rack trave: 8.00  
Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 540...640  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 380  
Rack travel in mm : 4,2...4,4  
: (4,1...4,5)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 315  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 340  
Rack travel in mm : (12,4...13,8  
Del.quantity cm3/ : -  
1000 s: (41,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

#### CHECKING THE IDLE-SPEED AUXILIARY

#### SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Testing and adjusting the control-rod-  
travel sensor with evaluation circuit

##### R2.1.3

##### Receiving inspection

Shift control lever to full-load stop.  
Set 13.5 V at stabilizer. Apply  
1850 hPa to ALDA. Run up to speed of  
1000 1/min; a voltage of 3.230...3.310  
(3.190...3.350) V must be displayed  
on the digital voltmeter.

##### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel  
delivery at 23.0...24.0 (22.0...25.0)  
ccm/1000 strokes with control lever.  
Shift control-rod-travel sensor until  
 $U = 2.095 \dots 2.105$  (2.098...2.102) V is  
indicated. Tighten fastening screws  
with 1...2 Nm. Control lever to full-  
load stop; voltage value of 3.230...  
3.310 V must be attained.

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction

screw on ALDA pressure box.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 E  
Edition : 17.02.89  
Replaces : 04.86  
Test oil : ISO-4113

Combination no. : 0 400 075 982

Injection pump  
Pump designation : PES5M55C320RS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF340/2300M59-4  
Governor no. : 0 420 021 043

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 2- 4- 5- 3

A23

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315

### Testing:

SET IDLE AUXILIARY SPRING

## TORQUE CONTROL

1st speed rpm : 1000

Rack travel in m: 11.30...11.40

2nd speed rpm : 1800

Rack travel in m: 10.90...11.10

3rd speed rpm : 2200

Rack travel in m: 10.60...10.80

1st version

```
Speed      rpm      : 1800
Del.quantity cm3/    : 34.0...35.5
           1000 s: (33.0...36.5)
```

Spread  $\text{cm}^3$  : 2.50

1000 s: (3.00)

Speed rpm : 2200

Del.quantity cm3/ : 33.5...35.5

1000 s: (32.5...36.5)

Spread cm<sup>3</sup> : 2.50

1000 s: (3.00)

## Speed rpm : 100

```
Del.quantity cm3/ : 55.0...0.0
1000 s: (55.0...0.0)
Rack travel in mm : 20.10...0.00
```

## 1st version

LOW IDLE

```
Speed      rpm      : 315
Rack travel in mm : 5.40...5.60
Del.quantity cm3/   : 5.0...6.0
           1000 s : (4.5...9.0)
Spread     cm3      : 1.00
           1000 s : (1.50)
```

## Control lever at idle stop

```
Speed rpm : 340
Rack travel in mm : (12,6...14,0)
Del.quantity cm3/ : -
1000 s : (33,0...41,0)
```

Current A : 1.8

Control lever at full-load stop

Speed rpm : 2950

Rack travel in mm : 0,0...1,0

### Current

short-duration A : 3,0

## Starting test

Speed rpm : 100

Del.quantity cm3/ : -  
min. 1000 s: 55,0

Remarks:

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^{\circ}$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^{\circ}$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

## TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315 \text{ 1/min.}$  and  $p_u = 450 \text{ mbar}$ ,  
control rod must move quickly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^{\circ} \dots 19.7^{\circ}$   
( $19.2 \dots 19.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,5 A  
Edition : 17.02.89  
Replaces : 12.85  
Test oil : ISO-4113  
Combination no. : 0 400 075 986  
Injection pump  
Pump designation : PES5M55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M55-3  
Governor no. : 0 420 021 041

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 350





# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 01  
Edition : 17.02.89  
Replaces : 12.85  
Test oil : ISO-4113

Combination no. : 0 400 075 991

Injection pump  
Pump designation : PES5M55C320RS108-1  
EP type number : 0 410 055 992  
Governor  
Governor design. : RSF350/2300M15  
Governor no. : 0 420 021 014

Customer-spec. information  
Customer : DB

Engine : OM617 (3.0 L)

1st version kW : 65.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...0.00

Firing order : 1- 2- 4- 5- 3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 3.9...4.0

100 s: (3.8...4.1)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 0.6...0.7

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 39.0...40.0

1000 : (38.0...41.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

### Testing:

1st rack travel in: 9.00

Speed rpm : 0...2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 9...13

Setting point w/out bumper spring

Speed rpm : 350



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W25  
Edition : 17.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 076 967  
Injection pump  
Pump designation : PES6M55C32ORS171-1  
EP type number : 0 410 056 987  
Governor  
Governor design. : RSF315/2300M60-8  
Governor no. : 0 420 021 114

Customer-spec. information  
Customer : DB-PKW

Engine : OM603-ECE

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.00 (1.00)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 12.50...12.60  
Del.quantity cm3/ : 3.1...3.2  
100 s: (3.0...3.3)  
Spread cm3 : 0.2  
100 s: (0.3)

2nd speed rpm : 290.0  
Rack travel in mm : 7.1...7.3  
Del.quantity cm3/ : 0.5...0.6  
100 s: (0.5...0.9)  
Spread cm3 : 0.1  
100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1100  
Del.quantity : 31.0...32.0  
1000 : (30.0...33.0)  
Spread cm3 : 2.50  
1000 : (3.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...0  
3rd rack travel in: 9,0...9,4  
Speed rpm : 2500  
4th rack travel in: 2950  
Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
Rack travel in mm : 1,7...1,8

LOW IDLE 1  
Control lever  
position degrees: 12...16  
Setting point w/out bumper spring



allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W26  
Edition : 17.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 076 969  
Injection pump  
Pump designation : PES6M55C32ORS174  
EP type number : 0 410 056 988  
Governor  
Governor design. : RSF315/2300M72-2  
Governor no. : 0 420 021 121

Customer-spec. information  
Customer : DB

Engine : OM603-Abgasl.

1st version kW : 76.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring



allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 300$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

#### START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock  
after start-of-delivery mean value of  
all cylinders,  $16.3...16.7^\circ$   
( $16.2...16.8^\circ$ ) angular displacement of  
the cam after cylinder 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (7.7...9.9) ccm/1000 strokes.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W22  
Edition : 17.02.89  
Replaces : 19.08.88  
Test oil : ISO-4113  
Combination no. : 0 400 076 970  
Injection pump  
Pump designation : PES6M55C320RS174  
EP type number : 0 410 056 988  
Governor  
Governor design. : RSF315/2300M60-21  
Governor no. : 0 420 021 122

Customer-spec. information  
Customer : DB

Engine : OM603-Abgasl.

1st version kW : 76.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 5- 3- 6- 2- 4

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Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

### Testing:

```
Speed      rpm : 220
Minimum rack travel: 7.00
Speed      rpm : 290
Rack travel in mm : 6.60...6.80
Rack travel in mm : 2.50
Speed      rpm : 570...670
Speed      rpm : 1000
Maximum rack travel: 1.50
```

SET IDLE AUXILIARY SPRING

```
Speed      rpm      : 360
Rack travel in mm : 5,20...5,40
                : (5,10...5,50)
```

## TORQUE CONTROL

Torque control curve - 1st version

```
1st speed rpm : 1000
  Rack travel in m: 12.40...12.50
2nd speed rpm : 1800
  Rack travel in m: 11.80...12.00
3rd speed rpm : 2200
  Rack travel in m: 11.50...11.70
```

## Aneroid/Altitude Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

## Measurement

Speed 1/min : 1000

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed          rpm : 1800
Del.quantity   cm3/ : 34.5...36.0
                1000 s: (33.5...37.0)
Spread         cm3  : 2.50
                1000 s: (3.00)
Aneroid pressure h: 1100
Speed          rpm : 2200
Del.quantity   cm3/ : 33.0...35.0
                1000 s: (32.0...36.0)

```

Spread            cm<sup>3</sup> : 2.50  
                     1000 s: (3.00)

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/     : 52.0...0.0
                1000 s : (52.0...0.0)
Rack travel    in mm    : 20.10...0.00
```

HIGH IDLE

1st version

```

Aneroid pressure h: 1100
Speed rpm : 2500
Rack travel in mm : 9.10...9.50
Del.quantity cm3/ : 22.0...26.0
1000 s: (21.0...27.0)
Spread cm3 : 2.50
1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 290
Rack travel in mm : 6.60...6.80
Del.quantity cm3/   : 5.5...6.5
           1000 s : (5.0...9.5)
Spread     cm3      : 1.00
           1000 s : (1.50)
```

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

```
Control lever at idle stop
Speed          rpm      : 315
Rack travel in mm : (12,8...14,2)
Del.quantity cm3/   : -
                1000 s : (28,0...36,0)
Current A        : 1,8
Control lever at full-load stop
Speed          rpm      : 2950
Rack travel in mm : 0,0...1,0
Current
short-duration A : 3,0
Starting test
Speed          rpm      : 100
Del.quantity cm3/   : -
min.          1000 s : 52,0
```

## Remarks:

Pin projection = 16.60...16.70 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock  
after start-of-delivery mean value of  
all cylinders,  $16.3...16.7^\circ$   
( $16.2...16.8^\circ$ ) angular displacement of  
the cam after cylinder 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W23  
Edition : 17.02.89  
Replaces : 05.08.88  
Test oil : ISO-4113

Combination no. : 0 400 076 971

Injection pump  
Pump designation : PES6M55C32ORS171  
EP type number : 0 410 056 989  
Governor  
Governor design. : RSF315/2300M60-8  
Governor no. : 0 420 021 114

Customer-spec. information  
Customer : DB

Engine : OM603-ECE

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300°

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 7.1...7.3

Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9.0...9.4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Spread            cm<sup>3</sup> : 2.50  
                     1000 s: (3.00)

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/      : 52.0...0.0
                1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00
```

HIGH IDLE

```

1st version
Aneroid pressure h: 1100
Speed          rpm : 2500
Rack travel in mm : 9.00...9.40
Del.quantity cm3/ : 22.0...26.0
                1000 s: (21.0...27.0)
Spread         cm3 : 2.50
                1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 290
Rack travel in mm : 7.10...7.30
Del.quantity cm3/  : 5.5...6.5
            1000 s : (5.0...9.5)
Spread     cm3      : 1.00
            1000 s : (1.50)
```

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,5...13,9)  
Del.quantity cm3/ : -  
1000 s : (27,0...35,0)

Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current

short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction

allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W24  
 Edition : 17.02.89  
 Replaces : 19.08.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 972  
 Injection pump  
 Pump designation : PES6M55C320RS171  
 EP type number : 0 410 056 989  
 Governor  
 Governor design. : RSF315/2300M72-1  
 Governor no. : 0 420 021 115

Customer-spec. information  
 Customer : DB

Engine : OM603-ECE

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.3...7.5

Del.quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring





allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 300$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:

adjustment and blocking with device

KDEP 1077 =  $19.3^\circ \dots 19.7^\circ$

( $19.2 \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

#### ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (9.0...11.0) ccm/1000 strokes.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W20  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113

Combination no. : 0 400 076 973

Injection pump  
Pump designation : PES6M55C320RS165  
EP type number : 0 410 056 990  
Governor  
Governor design. : RSF315/2300M66-2  
Governor no. : 0 420 021 099

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.8...8,2

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 300



displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)

Control lever at full-load stop. With  
 $n = 1000$  1/min.,  $I = 2.5$  A, control-rod-  
travel reduction = 2.25...2.55 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W10  
Edition : 17.02.89  
Replaces : 30.03.87  
Test oil : ISO-4113  
  
Combination no. : 0 400 076 975  
  
Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M66  
Governor no. : 0 420 021 066

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.60)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100 s: (0.6...1.0)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,9...9,3

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 300

### Testing:

```

Speed      rpm      : 220
Minimum rack travel: 7.00
Speed      rpm      : 300
Rack travel in mm   : 6.10...6.30
Rack travel in mm   : 1.50
Speed      rpm      : 600...700
Speed      rpm      : 1000
Maximum rack travel: 1.00

```

## SET IDLE AUXILIARY SPRING

```
Speed      rpm      : 360
Rack travel in mm : 4,20...4,40
                : (4,10...4,50)
```

## TORQUE CONTROL

```

Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 11.30...11.40
2nd speed   rpm   : 1800
  Rack travel in m: 10.80...11.00
3rd speed   rpm   : 2200
  Rack travel in m: 10.50...10.70

```

## FUEL DELIVERY CHARACTERISTICS

1st version

```
Speed      rpm      : 1800
Del.quantity cm3/    : 34.0...35.5
           1000 s : (33.0...36.5)
Spread     cm3      : 2.50
           1000 s : (3.00)
Speed      rpm      : 2200
Del.quantity cm3/    : 33.5...35.5
           1000 s : (32.5...36.5)
Spread     cm3      : 2.50
           1000 s : (3.00)
```

STARTING FUEL DELIVERY

```
Speed      rpm      : 100
Del.quantity cm3/    : 55.0...0.0
              1000 s: (55.0...0.0)
Rack travel in mm : 20.10...0.00
```

## HIGH IDLE

1st version

```

Speed          rpm      : 2500
Rack travel in mm : 7.90...8.30
Del.quantity   cm3/     : 22.0...26.0
                1000 s : (21.0...27.0)
Spread         cm3      : 2.50
                1000 s : (3.00)

```

LOW IDLE

```
Speed          rpm      : 300
Rack travel in mm : 6.10...6.30
Del.quantity   cm3/     : 6.5...7.5
                1000 s : (6.0...10.0)
Spread         cm3      : 1.00
                1000 s : (1.50)
```

# SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

```
Control lever at idle stop
Speed          rpm      : 315
Rack travel in mm : (12,0...13,4)
Del.quantity cm3/   : -
                  1000 s: (30,0...38,0)
Current A        : 1,8
Control lever at full-load stop
Speed          rpm      : 2950
Rack travel in mm : 0,0...1,0
Current
short-duration A : 3,0
Starting test
Speed          rpm      : 100
Del.quantity cm3/   : -
min.           1000 s: 55,0
```

Remarks:

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^{\circ}$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^{\circ}$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

## CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^{\circ} \dots 19.7^{\circ}$   
( $19.2^{\circ} \dots 19.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular

displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At  $n = 1000$  min.  $-1$ ,  
 $I = 2.5$  A, difference in delivery referenced to full-load  
delivery (8.8...10.8) ccm/1000 strokes.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W21  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113

Combination no. : 0 400 076 976

Injection pump  
Pump designation : PES6M55C32ORS157-1  
EP type number : 0 410 056 991  
Governor  
Governor design. : RSF450/2300M68  
Governor no. : 0 420 021 095

Customer-spec. information  
Customer : DB

Engine : OM603A (3.0L)

1st version kW : 100.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 4.6...4.7

100 s: (4.5...4.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 450.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 46.5...47.5

1000 : (45.5...48.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,5...8,9

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 10...14

Setting point w/out bumper spring



Speed rpm : 450  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 250  
Minimum rack trave: 13.00  
Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.50  
Speed rpm : 620...720  
Speed rpm : 1000  
Maximum rack trave: 2.00

#### SET IDLE AUXILIARY SPRING

Speed rpm : 500  
Rack travel in mm : 4,30...4,50  
: (4,20...4,60)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1600  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 2200  
Rack travel in m: 11.50...11.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1500  
Rack travel mm : 0.00...0.40

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 2.70...2.90  
2nd pressure hPa : 750  
Rack travel in m: 4.40...4.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 45.5...47.0  
1000 s: (44.5...48.0)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 44.0...46.0  
1000 s: (43.0...47.0)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 34.0...35.0  
1000 s: (33.0...36.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.50...8.90  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING PNUEUMATIC FAST IDLE (ELA)

Speed rpm : 500  
Rack travel in mm : (6,8...8,4)  
Del.quantity cm3/ : -  
1000 s: (14,0...22,0)  
Vacuum hPa : 600

#### Remarks:

Pin projection = 16.60...16.70 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,

control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $19.3^{\circ} \dots 19.7^{\circ}$   
( $19.2 \dots 19.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^{\circ}$  angular  
displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY  
-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W19  
Edition : 17.02.89  
Replaces : 06.09.88  
Test oil : ISO-4113

Combination no. : 0 400 076 977

Injection pump  
Pump designation : PES6M55C320RS165  
EP type number : 0 410 056 990  
Governor  
Governor design. : RSF315/2300M60-7  
Governor no. : 0 420 021 092

Customer-spec. information  
Customer : DB

Engine : OM603-3.0; MJ:88

1st version kW : 75.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 3.0...3.1

100 s: (2.9...3.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 800

Aneroid pressure h: 1100

Del.quantity : 30.5...31.5

1000 : (29.5...32.5)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 0...50

3rd rack travel in: 9,2...9,6

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,9...2,0

## LOW IDLE 1

Control lever

position degrees: 10...14

Setting point w/out bumper spring



allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP\ 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.  
Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W4  
Edition : 17.02.89  
Replaces : 02.86  
Test oil : ISO-4113

Combination no. : 0 400 076 986

Injection pump  
Pump designation : PES6M55C320RS157-1  
EP type number : 0 410 056 991  
Governor  
Governor design. : RSF315/2300M65  
Governor no. : 0 420 021 060

Customer-spec. information  
Customer : DB

Engine : OM603A Touring

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring



#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm  
control-rod travel at correction  
screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
 $KDEP\ 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W3  
 Edition : 17.02.89  
 Replaces : 02.86  
 Test oil : ISO-4113  
 Combination no. : 0 400 076 987  
 Injection pump  
 Pump designation : PES6M55C320RS157  
 EP type number : 0 410 056 993  
 Governor  
 Governor design. : RSF315/2300M64-2  
 Governor no. : 0 420 021 059

Customer-spec. information  
 Customer : DB

Engine : OM603A

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

C03

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,1...8,5

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 290  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.50  
Speed rpm : 510...610  
Speed rpm : 1000  
Maximum rack trave: 1.80

#### SET IDLE AUXILIARY SPRING

Speed rpm : 360  
Rack travel in mm : 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1600  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 2200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 1600  
Rack travel mm : 0.50...0.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 1050  
Rack travel in m: 3.90...4.10  
2nd pressure hPa : 750  
Rack travel in m: 5.80...6.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1850  
Speed rpm : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000 s: (49.0...52.5)  
Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1850  
Speed rpm : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000 s: (47.5...51.5)

Spread cm3 : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1050  
Speed rpm : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000 s: (32.0...35.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1850  
Speed rpm : 2500  
Rack travel in mm : 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000 s: (28.0...34.0)  
Spread cm3 : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 5.5...6.5  
1000 s: (5.0...9.5)  
Spread cm3 : 1.00  
1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 315  
Rack travel in mm : (12,8...14,2)  
Del.quantity cm3/ : -  
1000 s: (42,0...49,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2950  
Rack travel in mm : 0,0...1,0  
Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm3/ : -  
min. 1000 s: 52,0

Remarks:

Pin projection = 16.60...16.70 mm

#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device  
 $KDEP\ 1077 = 19.3^\circ \dots 19.7^\circ$   
( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit  
R2.1.3

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095 \dots 2.105$  (2.098...2.102) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...3.310 V must be attained.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W5  
Edition : 17.02.89  
Replaces : 12.09.86  
Test oil : ISO-4113

Combination no. : 0 400 076 988

Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M60-4  
Governor no. : 0 420 021 057

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,80...8,20

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 0,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 290



displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W2  
Edition : 17.02.89  
Replaces : 02.86  
Test oil : ISO-4113

Combination no. : 0 400 076 992

Injection pump  
Pump designation : PES6M55C32ORS157  
EP type number : 0 410 056 993  
Governor  
Governor design. : RSF315/2300M64  
Governor no. : 0 420 021 044

Customer-spec. information  
Customer : DB

Engine : OM603A

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,10...8,50

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

### Testing:

## SET IDLE AUXILIARY SPRING

## TORQUE CONTROL

1st version

## FUEL DELIVERY CHARACTERISTICS

## 1st version

STARTING FUEL DELIVERY

HIGH IDLE

1st version

LOW IDLE

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Remarks:

C10



#### CORRECTION OF INJECTED-FUEL QUANTITY

-Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position  $46.5^\circ$ , control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At  $n = 290$  1/min and  $p_u = 450$  mbar control rod must move briskly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max.  $1^\circ$  angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device  $KDEP\ 1077 = 19.3^\circ \dots 19.7^\circ$  ( $19.2^\circ \dots 19.8^\circ$ ) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit

#### R2.1.3

#### Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

#### Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until  $U = 2.095 \dots 2.105$  (2.098...2.102) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...3.310 V must be attained.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,0 W  
Edition : 06.04.88  
Replaces : 09.03.87  
Test oil : ISO-4113

Combination no. : 0 400 076 994

Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/23GOM59-3  
Governor no. : 0 420 021 040

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 290.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.5...32.5

1000 : (30.5...33.5)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,80...8,20

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 10000

Rack travel in mm : ,9...1,0

## LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 290



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 40  
 Edition : 24.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 463 158  
 Injection pump  
 Pump designation : PES3A80D410/3RS1324  
 EP type number : 0 410 483 017  
 Governor  
 Governor design. : RSV325...1150A8C705-1L  
 Governor no. : 0 420 232 521

Customer-spec. information  
 Customer : KHD

Engine : F3L912

1st version kW : 37.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 5.4...5.5

100 s: (5.2...5.6)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 8.3...8.5

Del.quantity cm3/ : 1.2...1.8

100 s: (1.0...1.9)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 54.0...55.0

1000 : (52.5...56.5)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 54...62

Testing:

1st rack travel in: 9.50

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1225...1255

3rd rack travel in: 4.00

Speed rpm : 1240...1270  
4th rack travel in: 1420  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 410...470

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 11.30...11.40  
3rd speed rpm : 950  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm3/ : 51.5...53.5  
1000 s: (49.5...55.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

Remarks:

: FENDT

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 41  
 Edition : 24.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 463 159  
 Injection pump  
 Pump designation : PES3A80D410/3RS1324  
 EP type number : 0 410 483 017  
 Governor  
 Governor design. : RSV325...1095A8C657-  
 5L  
 Governor no. : 0 420 232 523

Customer-spec. information  
 Customer : KHD

Engine : F3L913 \*

1st version kW : 33.0  
 Rated speed : 2190

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 5.0...5.1

100 s: (4.9...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 325.0

Rack travel in mm : 8.3...8.5

Del.quantity cm3/ : 1.2...1.8

100 s: (1.0...1.9)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Del.quantity : 50.5...51.5

1000 : (49.0...53.0)

Spread cm3 : 2.50

1000 : (3.50)

## RATED SPEED

1st version

Control lever

position degrees: 51...59

Testing:

1st rack travel in: 8.70

Speed rpm : 1145...1155

2nd rack travel in: 4.00

Speed rpm : 1175...1205  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

Remarks:

: FENDT

#### LOW IDLE 1

Control lever

position degrees: 19...27

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 325

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 410...470

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1095

Rack travel in m: 9.70...9.80

2nd speed rpm : 500

Rack travel in m: 10.70...10.80

3rd speed rpm : 1015

Rack travel in m: 10.20...10.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1095

Del.quantity cm<sup>3</sup>/ : 48.0...52.0

1000 s: (46.0...54.0)

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 33.0...34.0

1000 s: (31.0...36.0)

Spread cm<sup>3</sup> : 2.50

1000 s: (-)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.70

Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 42  
 Edition : 03.03.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 464 135  
 Injection pump  
 Pump designation : PES4A80D410/3RS1300  
 EP type number : 0 410 484 015  
 Governor  
 Governor design. : RSV325...1150A8C657-  
 4L  
 Governor no. : 0 420 232 522  
 Customer-spec. information  
 Customer : KHD  
 Engine : F4L912  
 1st version kW : 51.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 10.50...10.60  
 Del.quantity cm3/ : 5.9...6.0  
 100 s: (5.8...6.2)  
 Spread cm3 : 0.2  
 100 s: (0.4)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm3/ : 0.9...1.5  
 100 s: (0.7...1.6)  
 Spread cm3 : 0.2  
 100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 59.5...60.5  
 1000 : (58.0...62.0)  
 Spread cm3 : 2.50  
 1000 : (4.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 54...62

Testing:  
 1st rack travel in: 9.50  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1220...1250  
 3rd rack travel in: 4.00



Speed rpm : 1250...1280  
4th rack travel in: 1420  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 455...515

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 10.80...10.90  
3rd speed rpm : 880  
Rack travel in m: 10.60...10.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 54.0...56.0  
1000 s: (52.0...58.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### Remarks:

: FENDT

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

11- 10- 3- 6- 7- 12

## Note remarks

Test sheet : KHD 19,0 q  
Edition : 12.09.86  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 640 113  
  
Injection pump  
Pump designation : PE12A95D610LS2453  
EP type number : 0 410 690 998  
Governor  
Governor design. : RQV300...1250AB1223L  
Governor no. : 0 420 212 092

Customer-spec. information  
Customer : KHD

Engine : F12L413F

1st version kW : 282.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 4- 9- 8- 5- 2-

Phasing : 0-15-60-75-120-135-  
180-195-240-255-300-  
315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 9.4...9.6

100 s : (9.2...9.8)

Spread cm3 : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.0...1.6

100 s : (0.7...1.8)

Spread cm3 : 0.7

100 s : (0.9)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 200

travel mm : 0.70...0.80

2nd speed rpm : 500

travel mm : 2.60...2.80

3rd speed rpm : 900

travel mm : 5.60...5.80

4th speed rpm : 1300

travel mm : 8.60...8.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 9.40

Speed rpm : 1290...1300

2nd rack travel in: 4.50

Speed rpm : 1360...1390

3rd rack travel in: 0.00...1.00

4th rack travel in: 1500

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 14...22

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 375...485

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 10.90...11.00

3rd speed rpm : 790

Rack travel in m: 10.70...10.90

4th speed rpm : 885

Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650

Del.quantity cm<sup>3</sup>/ : 93.5...96.5

1000 s: (91.0...99.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1290...1300

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 13.50...14.20

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,7 p5  
Edition : 07.02.89  
Replaces : 5.8.88  
Test oil : ISO-4113

Combination no. : 0 400 648 111

Injection pump  
Pump designation : PE8A95D410LS2608  
EP type number : 0 410 698 988  
Governor  
Governor design. : RQ300/1250AB987DL  
Governor no. : 0 420 202 277

Customer-spec. information  
Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.5

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 96.5...98.5

1000 : (94.5...100.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0

Testing:

1st rack travel in: 9.40

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1335...1365

4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 345...385  
Speed rpm : 550  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Dimension a mm : 0.25  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 550  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 850  
Rack travel in m: 10.60...10.80  
4th speed rpm : 970  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 95.0...98.0  
1000 s: (92.5...95.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 600

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1295...1310

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 5.50  
1000 s: (7.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,7 p2  
 Edition : 07.02.89  
 Replaces : 18.9.87  
 Test oil : ISO-4113

Combination no. : 0 400 648 141

Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQV300...1250AB1195L  
 Governor no. : 0 420 212 172

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.5...6.7  
 Del.quantity cm3/ : 0.9...1.5  
 100 s: (0.6...1.7)

Spread cm3 : 0.5  
 100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.30  
 2nd speed rpm : 500  
 travel mm : 2.80...3.00  
 3rd speed rpm : 1000  
 travel mm : 6.50...6.70  
 4th speed rpm : 1290  
 travel mm : 8.60...8.80  
 5th speed rpm : 1375  
 travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 96.5...98.5  
 1000 : (94.5...100.5)

Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 47...55

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1360...1390  
4th rack travel in: 1500  
Speed rpm : 0.30...1.00

LOW IDLE 1  
Control lever  
position degrees: 14...22  
Rack travel in mm : 6.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 375...485

TORQUE CONTROL  
Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 850  
Rack travel in m: 10.60...10.80  
4th speed rpm : 950  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm3/ : 95.0...98.0  
1000 s: (92.5...100.5)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,7 p6  
 Edition : 07.02.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 648 142  
 Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQV350...1250AB990-1  
 L  
 Governor no. : 0 420 212 182

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 174.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1225

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.20...1.30

2nd speed rpm : 600  
 travel mm : 3.80...4.00

3rd speed rpm : 900  
 travel mm : 5.20...5.50

4th speed rpm : 1315  
 travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1225

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1225

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

Spread cm3 : 3.50

1000 : (6.00)



## RATED SPEED

1st version  
Control Lever  
position degrees: 61...69

Testing:  
1st rack travel in: 9.00  
Speed rpm : 1265...1275  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 9...17

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 370...480

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1225  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 500  
Rack travel in m: 10.40...10.50  
3rd speed rpm : 970  
Rack travel in m: 10.20...10.40  
4th speed rpm : 1080  
Rack travel in m: 9.80...10.00

## START CUT-OUT

Speed 1/min : 270 (290)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 90.5...93.5  
1000 s: (88.0...96.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.00  
Speed rpm : 1265...1275

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## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.70...15.30

Remarks:  
:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 15,8 l  
Edition : 07.02.89  
Replaces : 5.84  
Test oil : ISO-4113  
  
Combination no. : 0 400 649 196  
  
Injection pump  
Pump designation : PE10A95D610/4LS2452  
EP type number : 0 410 699 998  
Governor  
Governor design. : RQV750AB996L  
Governor no. : 0 420 212 091

Customer-spec. information  
Customer : KHD

Engine : F10L413F

1st version kW : 162.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 9.00...12.00

D01

Firing order : 1-10- 9- 4- 3- 6-  
5- 8- 7- 2

Phasing : 0-27-72-99-144-171-  
216-243-288-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 710

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 5.6...5.8  
Del.quantity cm3/ : 0.4...0.9  
100 s: (0.1...1.1)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 760

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 710  
Del.quantity : 96.0...98.0  
1000 : (94.0...100.0)  
Spread cm3 : 3.00  
1000 : (6.00)

## RATED SPEED

### 1st version

Setting point:  
Speed rpm : 760  
Rack travel in mm : 16.5

### Testing:

1st rack travel in: 9.70  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 773...788

## START CUT-OUT

Speed 1/min : 660 (680)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70

Speed rpm : 750...755

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 116.5

1000 s: ( 113.5)

Rack travel in mm : 13.90...14.30

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

## APPLICATION

Compressor

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 15,0 d1  
 Edition : 10.02.89  
 Replaces : 4.86  
 Test oil : ISO-4113  
 Combination no. : 0 400 649 240  
 Injection pump  
 Pump designation : PE10A95D520/5LS2604  
 EP type number : 0 410 699 993  
 Governor  
 Governor design. : RQV250...1150AB1189R  
 Governor no. : 0 420 213 102

Customer-spec. information  
 Customer : MAN

Engine : D2840 ME

1st version kW : 270.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 9.00...12.00

Firing order : 10- 9- 4- 1- 8- 7-  
 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 12.8...13.0

100 s: (12.2...12.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 2.00...2.50

2nd speed rpm : 850

travel mm : 5.75...6.00

3rd speed rpm : 1150

travel mm : 7.50...7.90

4th speed rpm : 1300

travel mm : 9.25...9.75

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1230

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 128.0...130.0

1000 : (122.5...128.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 58...66

Testing:

1st rack travel in: 12.00

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1280...1310

4th rack travel in: 14.00

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rpm : 100

Speed rpm : 250

Rack travel in mm : 6.90...7.10

Rack travel in mm : 2.00

Speed rpm : 400...460

## TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 13.00...13.10

2nd speed rpm : 500

Rack travel in m: 13.00...13.20

## START CUT-OUT

Speed 1/min : 170 (190)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 1190...1200

## STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 15.90...16.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 12,7 r1  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 400 678 040

Injection pump  
Pump designation : PE8A95D410LS2451  
EP type number : 0 410 698 992  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
Rated speed : 2650  
2nd version kW : 157.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1325  
Rack travel in mm : 9.70...9.80  
Del.quantity cm3/ : 9.1...9.3  
100 s: (8.9...9.5)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.1  
Del.quantity cm3/ : 0.9...1.5  
100 s: (0.6...1.7)  
Spread cm3 : 0.5  
100 s: (0.9)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1325  
Del.quantity : 91.5...93.5  
1000 : (89.5...95.5)  
Spread cm3 : 3.00  
1000 : (6.00)

2nd version  
Speed rpm : 1150  
Del.quantity cm3/ : 83.0...85.0  
1000 s: (81.0...87.0)  
Spread cm3 : 3.00  
1000 s: (3.00)

## RATED SPEED

1st version

Control lever  
position degrees: 59...67

Remarks:

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1365...1375  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1575  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 310...370  
Speed rpm : 700  
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1325  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 500  
Rack travel in m: 10.00...10.10

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1365...1375

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 116.5...127.5  
1000 s: (113.5...130.5)  
Rack travel in mm : 14.00...14.40

#### HIGH IDLE

1st version  
Rack travel in mm : 3.90...4.10  
Spread cm<sup>3</sup> : 10.00

D06

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,8 g  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 844 048  
Injection pump  
Pump designation : PES4A90D410RS2294  
EP type number : 0 410 894 011  
Governor  
Governor design. : RQV300...1425AB780L  
Governor no. : 0 420 212 045

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 314

1st version kW : 64.0  
Rated speed : 2850

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Rack travel in mm : 9.00...12.00

DO7

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.70...9.80

Del.quantity cm3/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.2

100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 8.40...8.60

2nd speed rpm : 950

travel mm : 5.20...5.50

3rd speed rpm : 775

travel mm : 4.10...4.60

4th speed rpm : 550

travel mm : 2.70...3.00

5th speed rpm : 300

travel mm : 0.70...1.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm3 : 3.00

1000 : (4.50)

## RATED SPEED



1st version  
Control lever  
position degrees: 61...69

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1460...1470  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION  
Speed rpm : 350...500

START CUT-OUT

Speed 1/min : 250 (240)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1460...1470

INTERMEDIATE RATED SPEED

Control lever  
position degrees: 42...50  
Rack travel in mm : 8.70  
Speed rpm : 695...705  
Rack travel in mm : 4.00  
Speed rpm : 830...860

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 71.0...81.0  
1000 s: (68.0...84.0)  
Rack travel in mm : 13.70...14.30

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 3,8 g 5  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 400 844 055

Injection pump  
Pump designation : PES4A90D410RS2294  
EP type number : 0 410 894 011  
Governor  
Governor design. : RQV300...1400AB836DL  
Governor no. : 0 420 212 050

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM314

1st version kW : 62.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
                  : (2.10...2.30)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.70...9.80

Del.quantity cm3/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.2

100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 8.40...8.60

2nd speed rpm : 950

travel mm : 5.20...5.50

3rd speed rpm : 775

travel mm : 4.10...4.60

4th speed rpm : 550

travel mm : 2.70...3.00

5th speed rpm : 300

travel mm : 0.70...1.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm3 : 3.00

1000 : (4.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 61...69

Testing:  
1st rack travel in: 8.70  
Speed rpm : 1460...1470  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.20  
Speed rpm : 300  
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION  
Speed rpm : 350...500

#### START CUT-OUT

Speed 1/min : 220 (240)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.70  
Speed rpm : 1460...1470

#### INTERMEDIATE RATED SPEED

Control lever  
position degrees: 113...121  
Rack travel in mm : 8.70  
Speed rpm : 1295...1305  
Rack travel in mm : 4.00  
Speed rpm : 1395...1425

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 71.0...81.0  
1000 s: (68.0...84.0)  
Rack travel in mm : 13.70...14.30

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 a 12  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 844 094  
 Injection pump  
 Pump designation : PES4A90D410RS2666-2  
 EP type number : 0 410 894 033  
 Governor  
 Governor design. : RQV300...1400AB1065-12L  
 Governor no. : 0 420 212 207  
 Customer-spec. information  
 Customer : DAIMLER-BENZ  
 Engine : OM364  
 1st version kW : 61.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400  
 Rack travel in mm : 10.50...10.60  
 Del.quantity cm3/ : 5.9...6.0  
 100 s: (5.7...6.2)  
 Spread cm3 : 0.3  
 100 s: (0.5)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 8.6...8.8  
 Del.quantity cm3/ : 0.8...1.2  
 100 s: (0.6...1.4)  
 Spread cm3 : 0.2  
 100 s: (0.4)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30  
 2nd speed rpm : 500  
 travel mm : 2.30...2.80  
 3rd speed rpm : 750  
 travel mm : 4.10...4.30  
 4th speed rpm : 1500  
 travel mm : 8.50...8.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1400  
 Del.quantity : 59.0...60.0  
 1000 : (57.0...62.0)  
 Spread cm3 : 3.00  
 1000 : (5.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 58...66

Testing:  
 1st rack travel in: 9.50

Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1535...1565  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 20...28

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.20  
Speed rpm : 300  
Rack travel in mm : 8.60...8.80

CONSTANT REGULATION  
Speed rpm : 540...680

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 450  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 850  
Rack travel in m: 10.90...11.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 450  
Del.quantity cm<sup>3</sup>/ : 45.0...47.0  
1000 s: (42.5...49.5)  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 47.5...50.5  
1000 s: (45.0...53.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 17.00...17.40

Remarks:

:  
Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 9,2 f 1  
Edition : 10.02.89  
Replaces : 28.8.87  
Test oil : ISO-4113

Combination no. : 0 400 845 079

Injection pump  
Pump designation : PES5A95D320LS2504  
EP type number : 0 410 895 984  
Governor  
Governor design. : RQ250/1100AB1197R  
Governor no. : 0 420 201 639

Customer-spec. information  
Customer : MAN

Engine : D2565 MUL

1st version kW : 141.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.3)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 3.00

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 10.30

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1195...1225

4th rack travel in: 1300

Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 250

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 370...410

#### TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.30...11.40

2nd speed rpm : 600

Rack travel in m: 11.70...11.80

3rd speed rpm : 940

Rack travel in m: 11.50...11.70

4th speed rpm : 1015

Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500

Del.quantity cm3/ : 113.0...116.0

1000 s: (110.5...118.5)

Speed rpm : 800

Del.quantity cm3/ : 115.5...118.5

1000 s: (113.0...121.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.30

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 147.0...157.0

1000 s: (144.0...160.0)

Rack travel in mm : 15.70...16.30

#### LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.40...6.60

Del.quantity cm3/ : 15.0...21.0

1000 s: (12.5...23.5)

Spread cm3 : 3.00  
1000 s: (5.00)

#### Remarks:

: MAN-NR. 2-7500  
Set idle stop at 250 min<sup>-1</sup> to a  
control-rod travel of 6.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,0 c 1  
Edition : 03.03.89  
Replaces : 5.9.88  
Test oil : ISO-4113

Combination no. : 0 400 846 264

Injection pump  
Pump designation : PES6A85D320RS2337  
EP type number : 0 410 886 921  
Governor  
Governor design. : RQ200/1250AB801DR  
Governor no. : 0 420 203 089

Customer-spec. information  
Customer : MAN

Engine : D0846HM42U

1st version kW : 118.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 7.0...7.1

100 s: (6.8...7.3)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 200.0

Rack travel in mm : 8.4...8.6

Del.quantity cm3/ : 1.8...2.4

100 s: (1.6...2.6)

Spread cm3 : -

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 550

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 70.0...71.0

1000 : (68.0...73.0)

Spread cm3 : 3.00

1000 : (4.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.75

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1325...1355



#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 200

Rack travel in mm : 8.5

#### Testing:

Speed rpm : 100

Minimum rack trave: 9.90

Speed rpm : 200

Rack travel in mm : 8.40...8.60

Rack travel in mm : 2.00

Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.70...10.80

2nd speed rpm : 500

Rack travel in m: 11.40...11.50

4th speed rpm : 1000

Rack travel in m: 11.20...11.40

5th speed rpm : 1125

Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500

Del.quantity cm3/ : 0.0...69.5

1000 s: (0.0...72.0)

Speed rpm : 800

Del.quantity cm3/ : 69.0...72.0

1000 s: (66.5...74.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 200

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.75

Speed rpm : 1295...1310

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 123.0...133.0

1000 s: (120.0...136.0)

Rack travel in mm : 18.10...18.50

Remarks:

: MAN-NR.1-7504

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 k 6  
Edition : 11.11.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 432  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQ750AB1240L  
Governor no. : 0 420 200 110

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kW : 122.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X-600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Testing:

1st rack travel in: 9.40

Speed rpm : 750...755

2nd rack travel in: 3.70

Speed rpm : 780...785

## TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 700

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 10.40...10.60

## START CUT-OUT

Speed 1/min : 640 (660)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 12.90...13.20

Remarks:

:

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 p 1  
 Edition : 09.03.87  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 433  
 Injection pump  
 Pump designation : PES6A95D410RS2416  
 EP type number : 0 410 896 961  
 Governor  
 Governor design. : RQ900AB1054L  
 Governor no. : 0 420 200 064

Customer-spec. information  
 Customer : KHD

Engine : F6L413FR

1st version kW : 106.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 9.00...9.10

Del.quantity cm3/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Del.quantity : 85.5...87.5

1000 : (83.5...89.5)

Spread cm3 : 3.00

1000 : (6.00)

## RATED SPEED

### 1st version

#### Testing:

1st rack travel in: 8.60

Speed rpm : 900...905

2nd rack travel in: 3.50

Speed rpm : 930...940

## START CUT-OUT

Speed 1/min : 810 (830)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 8.60

Speed rpm : 900...905

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 13.20...13.80

Remarks:

:

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 p 2  
Edition : 07.02.89  
Replaces : 30.5.88  
Test oil : ISO-4113

Combination no. : 0 400 846 538

Injection pump  
Pump designation : PES6A95D32ORS2693  
EP type number : 0 410 896 914  
Governor  
Governor design. : RQ300/1300AB1204R  
Governor no. : 0 420 201 640

Customer-spec. information  
Customer : DAF

Engine : DNT 620

1st version kW : 130.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 0.90...1.00

Del.quantity cm3/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 850

Rack travel in mm : 16.80...18.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 77.5...78.5

1000 : (75.5...80.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 850

Rack travel in mm : 17.6

Testing:

1st rack travel in: 9.70  
Speed rpm : 1350...1365  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 100  
Minimum rack trave: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 545...585

TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 850  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 935  
Rack travel in m: 10.80...11.10  
4th speed rpm : 1080  
Rack travel in m: 10.60...11.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 250  
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 1290  
Del.quantity cm3/ : 73.0...75.0  
1000 s: (70.5...77.5)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 65.0...67.0  
1000 s: (63.0...69.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1350...1365

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...145.0  
1000 s: (127.0...148.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

When adjusting the governor, observe  
service information on microcard  
W-400/008.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 3,1 b 2  
 Edition : 10.02.89  
 Replaces : 12.1.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 863 008  
 Injection pump  
 Pump designation : PES3A90D320/3RS2658  
 EP type number : 0 410 893 004  
 Governor  
 Governor design. : RSV325...1500A2C505-3R  
 Governor no. : 0 420 233 229

Customer-spec. information  
 Customer : MWM

Engine : D226B-3

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

## BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 11.20...11.30  
 Del.quantity cm<sup>3</sup>/ : 8.9...9.0  
 100 s: (8.7...9.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 9.7...9.9  
 Del.quantity cm<sup>3</sup>/ : 4.6...5.2  
 100 s: (4.4...5.4)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 89.5...90.5  
 1000 : (87.5...92.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 39...47

Testing:  
 1st rack travel in: 10.20  
 Speed rpm : 1140...1150



2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1375  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 9.3  
Speed rpm : 325  
Rack travel in mm : 9.70...9.90  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.40

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0  
1000 s: ( 112.0)  
Rack travel in mm : 16.80...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 31  
 Edition : 22.05.87  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 400 864 069

Injection pump  
 Pump designation : PES4A85D410/3RS2732  
 EP type number : 0 410 884 947  
 Governor  
 Governor design. : RSV325...1175A8C2163  
 -3L  
 Governor no. : 0 420 232 474

Customer-spec. information  
 Customer : KHD

Engine : F4L913

1st version kW : 55.0  
 Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance ± - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 9.80...9.90

Del.quantity cm3/ : 6.7...6.8

100 s: (6.5...7.0)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Del.quantity : 67.0...68.0

1000 : (65.0...70.0)

Spread cm3 : 3.00

1000 : (4.50)

## RATED SPEED

1st version

Control lever

position degrees: 53...61

Testing:

1st rack travel in: 8.80

Speed rpm : 1215...1225

2nd rack travel in: 4.00

Speed rpm : 1235...1265

3rd rack travel in: 4.00

Speed rpm : 1255...1285  
4th Rack travel in: 1420  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 460...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.40  
3rd speed rpm : 800  
Rack travel in m: 10.20...10.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 58.0...60.0  
1000 s: (55.5...62.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1215...1225

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 17.10...17.30

Remarks:

: TKS 2.80

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 5,9 f 5  
 Edition : 27.03.87  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 109  
 Injection pump  
 Pump designation : PES6A90D210RS2629  
 EP type number : 0 410 896 075  
 Governor  
 Governor design. : RSV350...1300A0C2139  
 L  
 Governor no. : 0 420 232 374

Customer-spec. information  
 Customer : FORD/GB

Engine : 380

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.00  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.70...2.80  
 : (2.65...2.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm3/ : 7.2...7.3  
 100 s: (7.0...7.5)  
 Spread cm3 : 0.3  
 100 s: (0.4)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 6.4...6.5  
 Del.quantity cm3/ : 0.9...1.3  
 100 s: (0.7...1.5)  
 Spread cm3 : 0.2  
 100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 72.0...73.0  
 1000 : (70.0...75.0)  
 Spread cm3 : 3.00  
 1000 : (4.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 64...72

Testing:  
 1st rack travel in: 11.90  
 Speed rpm : 1365...1375  
 2nd rack travel in: 4.00  
 Speed rpm : 1480...1510  
 3rd rack travel in: 4.00  
 Speed rpm : 1505...1535  
 4th rack travel in: 1670  
 Speed rpm : 0.30...1.70

LOW IDLE 1  
 Control lever

position degrees: 30...38  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 515...575  
Speed rpm : 650  
Maximum rack trave: 1.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1365...1375

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 76.0...90.0  
1000 s: (73.0...93.0)  
Rack travel in mm : 19.00...21.00

Remarks:

:

At start of delivery, locating pin  
must latch into slit in pointer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 24  
 Edition : 07.02.89  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 400 866 118

Injection pump  
 Pump designation : PES6A85D410/3RS2611  
 EP type number : 0 410 886 902  
 Governor  
 Governor design. : RSV325...1150A8C604L  
 Governor no. : 0 420 232 319

Customer-spec. information  
 Customer : KHD

Engine : F6L913

1st version kW : 78.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)  
 Rack travel in mm : 9.00...12.00

E01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 6.0...6.1

100 s: (5.8...6.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.4...8.6

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 60.5...61.5

1000 : (58.5...63.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 49...57

Testing:

1st rack travel in: 9.20

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1215...1245

3rd rack travel in: 4.00

Speed rpm : 1240...1270

4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 8.0

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 8.40...8.60  
Rack travel in mm : 2.00  
Speed rpm : 440...500

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm3/ : 39.5...41.5  
1000 s: (37.0...44.0)  
Speed rpm : 800  
Del.quantity cm3/ : 48.0...50.0  
1000 s: (45.5...52.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 k 2  
 Edition : 15.06.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 124  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1250AOC2216  
 -2R  
 Governor no. : 0 420 233 217

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CT 830

1st version kW : 160.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

E03

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 12.1...12.3

100 s: (11.9...12.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 121.0...123.0

1000 : (119.0...125.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 58...66

Testing:



1st rack travel in: 11.00  
Speed rpm : 1290...1300  
2nd rack travel in: 4.00  
Speed rpm : 1395...1425  
4th rack travel in: 1500  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 33...41  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 510...570

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 122.0...126.0  
1000 s: (120.0...128.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1290...1300

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400

E04

Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L  
 Edition : 20.12.88  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 128  
 Injection pump  
 Pump designation : PES6A100D32G/3RS2763  
 EP type number : 0 410 806 006  
 Governor  
 Governor design. : RSV410...950A0C2190-  
 26R  
 Governor no. : 0 420 233 224

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CT

1st version kW : 138.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

E05

Prestroke mm : 2.80...2.90  
 : (2.75...3.00)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950  
 Rack travel in mm : 9.60...9.70  
 Del.quantity cm3/ : 8.4...8.6  
 100 s: (8.2...8.8)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 410.0  
 Rack travel in mm : 5.0...5.2  
 Del.quantity cm3/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 950  
 Del.quantity : 84.5...86.5  
 1000 : (82.5...88.5)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 40...48

Testing:

1st rack travel in: 8.60  
Speed rpm : 1010...1020  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1150  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 410  
Rack travel in mm : 4.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 410  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 455...515

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 650  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 99.0...103.0  
1000 s: (97.0...105.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1010...1020

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 410  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L 1  
Edition : 20.12.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 866 129  
Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1050AOC2190  
-27R  
Governor no. : 0 420 233 225

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 111.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 1.1...1.5  
100 s: (0.9...1.8)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 9.20  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 750  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 99.0...103.0  
1000 s: (97.0...105.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.50

E08

Del.quantity cm<sup>3</sup>/ : 11.5...15.5  
1000 s: (9.0...18.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

## Note remarks

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

```
1st version
Control lever
position degrees: 44...48
```

Testing:

1st rack travel in: 12.40  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 960...990  
3rd rack travel in: 4.00  
4th rack travel in: 1030  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 435...495

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 m 1  
Edition : 20.12.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 866 138  
Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV425...750A4C2213-3R  
Governor no. : 0 420 233 235

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT- 8.3 L

1st version kW : 135.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 425.0  
Rack travel in mm : 6.0...6.2  
Del.quantity cm3/ : 1.8...2.2  
100 s: (1.5...2.4)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity : 142.5...144.5

1000 : (140.5...146.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 37...45

Testing:



1st rack travel in: 13.00  
Speed rpm : 795...805  
2nd rack travel in: 4.00  
Speed rpm : 825...855  
3rd rack travel in: 4.00  
Speed rpm : 830...860

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 795...805

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 l 2  
Edition : 20.12.88  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 866 139  
  
Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1250A0C2190  
-32R  
Governor no. : 0 420 233 236

Customer-spec. information  
Customer : CDC

Engine : 6 CT 8.3 ltr

1st version kW : 114.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.1...5.3

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 53...61

Testing:

1st rack travel in: 8.20  
Speed rpm : 1310...1320  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
3rd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 28...36  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 800  
Rack travel in m: 9.60...9.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 80.5...84.5  
1000 s: (78.5...86.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1310...1320

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.10...5.30

Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 5,9 v  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 143  
 Injection pump  
 Pump designation : PES6A95D120RS2773  
 EP type number : 0 410 896 904  
 Governor  
 Governor design. : RSV350...1250A2C2237  
 R  
 Governor no. : 0 420 233 240

Customer-spec. information  
 Customer : CUMMINS

Engine : 6BT  
 1st version kW : 118.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 017  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

E15

Prestroke mm : 2.10...2.20  
 : (2.05...2.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 9.40...9.50  
 Del.quantity cm3/ : 8.8...9.0  
 100 s: (8.6...9.3)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.4)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 88.5...90.5  
 1000 : (86.0...93.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 39...47

Testing:  
 1st rack travel in: 8.40  
 Speed rpm : 1290...1300

2nd rack travel in: 4.00  
Speed rpm : 1355...1385  
3rd rack travel in: 4.00  
Speed rpm : 1365...1395  
4th rack travel in: 1530  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 465...525

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 77.0...80.0  
1000 s: (75.0...82.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (107.0...123.0)  
Rack travel in mm : 14.10...14.50

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...22.0  
1000 s: (13.5...24.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark = 12,5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238A  
 Injection pump  
 Pump designation : PES4A95D41ORS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 NA

1st version kW : 60.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 9.00...9.10

Del.quantity cm3/ : 7.5...7.7

100 s: (7.3...7.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 75.0...77.0

1000 : (73.0...79.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 39...47

### Testing:

1st rack travel in: 8.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 9.00...9.10  
2nd speed rpm : 500  
Rack travel in m: 9.00...9.20

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 62.5...65.5  
1000 s: (60.0...68.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 8.00  
Speed rpm : 1040...1050

### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238B  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 NA

1st version kW : 70.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 39...47



### Testing:

1st rack travel in: 9.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 80.5...83.5  
1000 s: (78.0...86.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1040...1050

### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 3  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238D  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 L  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 NA

1st version kW : 62.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 77.0...79.0  
 1000 : (75.0...81.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 44...52

### Testing:

1st rack travel in: 8.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 520...580

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 500  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 890  
Rack travel in m: 10.30...10.50

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 825  
Del.quantity cm<sup>3</sup>/ : 82.5...85.5  
1000 s: (80.0...88.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1040...1050

### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 4  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 874 238E  
  
Injection pump  
Pump designation : PES4A95D410RS2685  
EP type number : 0 410 894 996  
Governor  
Governor design. : RSV400...1000A1C2187  
L  
Governor no. : 0 420 232 387

Customer-spec. information  
Customer : LIEBHERR

Engine : D904 TB

1st version kW : 77.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45  
  
Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
Rack travel in mm : 6.3...6.5  
Del.quantity cm3/ : 1.0...1.6  
100 s: (0.7...1.8)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 10.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
3rd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1235  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL

Dimension a mm : 1.15  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 820  
Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 112.0...115.0  
1000 s: (109.5...117.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 5  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238F  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 T

1st version kW : 81.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.3...11.5  
 100 s: (11.1...11.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.75

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000  
 Del.quantity : 113.0...115.0  
 1000 : (111.0...117.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

### 1st version

Control lever  
 position degrees: 42...50

Testing:

1st rack travel in: 11.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
3rd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.60...12.60  
3rd speed rpm : 880  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 900  
Del.quantity cm3/ : 121.0...124.0  
1000 s: (118.5...126.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 6  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238G  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387  
 Customer-spec. information  
 Customer : LIEBHERR  
 Engine : D904 T  
 1st version kW : 88.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 13.00...13.10  
 Del.quantity cm3/ : 12.5...12.7  
 100 s: (12.3...12.9)  
 Spread cm3 : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 125.0...127.0  
 1000 : (123.0...129.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 40...48



#### Testing:

1st rack travel in: 12.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 500  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 119.0...122.0  
1000 s: (116.5...124.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1040...1050

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 7  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238H  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 TB

1st version kW : 67.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 9.2...9.4

100 s: (9.0...9.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 92.0...94.0

1000 : (90.0...96.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 9.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 900  
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 98.0...101.0  
1000 s: (95.5...103.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 a 8  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 238J  
 Injection pump  
 Pump designation : PES4A95D410RS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 T

1st version kW : 90.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del. quantity cm3/ : 12.1...12.3  
 100 s: (11.9...12.5)

Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del. quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del. quantity : 121.5...123.5  
 1000 : (119.5...125.5)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 40...48

Testing:

1st rack travel in: 11.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
3rd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1245  
Speed rpm : 0.30...1.40

Remarks:

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.5  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 500  
Rack travel in m: 12.50...12.70

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

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# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 a 1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 322A  
 Injection pump  
 Pump designation : PES6A95D41ORS2689  
 EP type number : 0 410 896 916  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387  
 Customer-spec. information  
 Customer : LIEBHERR  
 Engine : D906 NA  
 1st version kW : 112.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 10.40...10.50  
 Del.quantity cm3/ : 8.7...8.9  
 100 s: (8.5...9.1)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 87.0...89.0  
 1000 : (85.0...91.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 39...47

Testing:

1st rack travel in: 9.40  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 515...575

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 77.5...80.5  
1000 s: (75.0...83.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 a 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 322B  
 Injection pump  
 Pump designation : PES6A95D410RS2689  
 EP type number : 0 410 896 916  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D906 TB

1st version kW : 118.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 39...47



#### Testing:

1st rack travel in: 10.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1225  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 510...570

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 870  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 113.0...116.0  
1000 s: (110.5...118.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1040...1050

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

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Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 a 3  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 322C  
 Injection pump  
 Pump designation : PES6A95D410RS2689  
 EP type number : 0 410 896 916  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D906 T

1st version kW : 132.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 115.0...117.0  
 1000 : (113.0...119.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 40...48

Testing:

1st rack travel in: 11.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 530...590

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
3rd speed rpm : 910  
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
Del.quantity cm3/ : 118.0...121.0  
1000 s: (115.5...123.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 c 2  
Edition : 03.03.89  
Replaces : 24.6.88  
Test oil : ISO-4113

Combination no. : 0 400 876 335

Injection pump  
Pump designation : PES6A90D410RS2710  
EP type number : 0 410 896 082  
Governor  
Governor design. : RSV350...1200A1C1154  
Governor no. : 0 420 232 468

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 74.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 5.1...5.2

100 s: (4.9...5.4)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 370.0

Rack travel in mm : 7.9...8.5

Del.quantity cm3/ : 1.0...1.2

100 s: (0.8...1.4)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 51.0...52.0

1000 : (49.0...54.0)

Spread cm3 : 3.00

1000 : (4.50)

## RATED SPEED

1st version

Control lever

position degrees: 59...67

2nd rack travel in: 8.30

Speed rpm : 1250...1245

3rd rack travel in: 4.00

Speed rpm : 1267...1280

4th rack travel in: 1400

Speed rpm : 0.30...1.40

## LOW IDLE 1

Control lever

position degrees: -3

Setting point w/out bumper spring

Speed rpm : 370

Rack travel in mm : 8.2

## Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 370

Rack travel in mm : 8.10...8.30

Rack travel in mm : 2.00

Speed rpm : 460...520

## TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 9.30...9.40

2nd speed rpm : 600

Rack travel in m: 10.00...10.20

3rd speed rpm : 900

Rack travel in m: 9.80...10.10

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Speed rpm : 600

Del.quantity cm3/ : 41.0...43.0

1000 s: (38.5...45.5)

Speed rpm : 900

Del.quantity cm3/ : 46.0...49.0

1000 s: (43.5...51.5)

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 85.0...95.0

1000 s: (82.0...98.0)

Rack travel in mm : 16.80...17.20

## LOW IDLE

Speed rpm : 370

Rack travel in mm : 7.90...8.50

Del.quantity cm3/ : 10.0...12.0

1000 s: (8.0...14.0)

Spread cm3 : 2.50

1000 s: (4.50)

Remarks:

:

## APPLICATION

Unimog

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# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 c 3  
 Edition : 03.03.89  
 Replaces : 2.9.88  
 Test oil : ISO-4113

Combination no. : 0 400 876 336

Injection pump  
 Pump designation : PES6A90D410RS2710  
 EP type number : 0 410 896 082  
 Governor  
 Governor design. : RSV350...1200A1C1154  
 -1L  
 Governor no. : 0 420 232 470

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 81.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

---

Rack travel in mm : 9.80...9.90

---

Del.quantity cm3/ : 5.3...5.4

---

100 s: (5.1...5.6)

---

Spread cm3 : 0.3

---

100 s: (0.4)

---

2nd speed rpm : 370.0  
 Rack travel in mm : 7.8...8.4  
 Del.quantity cm3/ : 1.0...1.2  
 100 s: (0.8...1.4)

---

Spread cm3 : 0.2  
 100 s: (8.4)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Del.quantity : 53.0...54.0  
 1000 : (51.0...56.0)

---

Spread cm3 : 3.00  
 1000 : (4.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 59...67

Testing:  
 1st rack travel in: 8.80  
 Speed rpm : 1240...1245  
 3rd rack travel in: 4.00  
 Speed rpm : 1295...1325  
 4th rack travel in: 1400

Speed rpm : 0.30...1.40

APPLICATION

LOW IDLE 1

Unimog

Control lever

position degrees: -3

Setting point w/out bumper spring

Speed rpm : 370

Rack travel in mm : 8.1

Testing:

Speed rpm : 100

Minimum rack trave: 19.50

Speed rpm : 370

Rack travel in mm : 8.00...8.20

Rack travel in mm : 2.00

Speed rpm : 470...530

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 9.80...9.90

2nd speed rpm : 600

Rack travel in m: 11.30...11.40

3rd speed rpm : 850

Rack travel in m: 11.10...11.30

4th speed rpm : 950

Rack travel in m: 10.30...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600

Del.quantity cm3/ : 50.0...52.0

1000 s: (47.5...54.5)

Speed rpm : 850

Del.quantity cm3/ : 51.0...54.0

1000 s: (48.5...56.5)

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 85.0...95.0

1000 s: (82.0...98.0)

Rack travel in mm : 17.10...17.50

LOW IDLE

Speed rpm : 370

Rack travel in mm : 7.80...8.40

Del.quantity cm3/ : 10.0...12.0

1000 s: (8.0...14.0)

Spread cm3 : 2.50

1000 s: (84.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RAB 9,7 d 1  
 Edition : 13.05.87  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 400 876 340

Injection pump  
 Pump designation : PES6A95D410RS2108R  
 EP type number : 0 410 896 927  
 Governor  
 Governor design. : RSV550...1100A1C607-  
 1L  
 Governor no. : 0 420 232 486

Customer-spec. information  
 Customer : RABA

Engine : D2356 HM6

1st version kW : 150.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.1)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 122.0...124.0

1000 : (120.0...126.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 48...56

Testing:

1st rack travel in: 12.40

Speed rpm : 1120...1130

2nd rack travel in: 4.00



Speed rpm : 1145...1175  
3rd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1340  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 550  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 635...695

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1080  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 400  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 250  
Rack travel in m: 14.60...15.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 0.0...124.5  
1000 s: (0.0...127.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 120.0...123.0  
1000 s: (117.5...125.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1120...1130

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RAB 10,8 b  
 Edition : 10.02.89  
 Replaces : 12.9.86  
 Test oil : ISO-4113  
 Combination no. : 0 401 246 013  
 Injection pump  
 Pump designation : PES6A100D410RS3039  
 EP type number : 0 411 206 018  
 Governor  
 Governor design. : RQ200/1100AB1215L  
 Governor no. : 0 420 200 102

Customer-spec. information  
 Customer : RABA

Engine : D2156 MTKLL 6

1st version kW : 206.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.60...1.70  
 : (1.55...1.75)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 15.0...15.2

100 s: (14.8...15.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 200.0

Rack travel in mm : 6.7...6.9

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 150.0...152.0

1000 : (148.0...154.0)

Spread cm3 : 3.00

1000 : (6.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1205...1235

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 200

Rack travel in mm : 6.8

#### Testing:

Speed rpm : 100

Minimum rack trave: 8.20

Speed rpm : 200

Rack travel in mm : 6.70...6.90

Rack travel in mm : 2.00

Speed rpm : 325...365

#### TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 13.40...13.50

2nd speed rpm : 600

Rack travel in m: 14.70...14.80

3rd speed rpm : 880

Rack travel in m: 14.00...14.20

4th speed rpm : 945

Rack travel in m: 13.50...13.80

#### Aneroid/Altitude

##### Compensator Test

#### 1st version

##### Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 14.60...14.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.70...10.80

2nd pressure hPa : 450

Rack travel in m: 13.70...13.80

3rd pressure hPa : 325

Rack travel in m: 12.10...12.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 750

Del.quantity cm3/ : 163.0...166.0

1000 s: (160.5...168.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 92.5...94.5

1000 s: (90.5...96.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 205.0...215.0

1000 s: (202.0...218.0)

Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 20,9 j  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 401 840 109  
Injection pump  
Pump designation : PE12P120A520/4LS857  
EP type number : 0 411 820 035  
Governor  
Governor design. : RQV250...1050PA889  
Governor no. : 0 421 813 696

Customer-spec. information  
Customer : MAN

Engine : D2542TE60

1st version kW : 361.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter  
x Wall thickness  
x Length mm : 8.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-

Phasing : 345  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : 6.5...6.7  
Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.80...1.20

2nd speed rpm : 700  
travel mm : 4.60...5.00

3rd speed rpm : 1050  
travel mm : 7.40...7.60

4th speed rpm : 1400  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1125  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050

Del.quantity : 145.0...147.0  
1000 : (142.0...150.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 10.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.10  
Speed rpm : 250  
Rack travel in mm : 6.50...6.70

#### CONSTANT REGULATION

Speed rpm : 400...520

#### START CUT-OUT

Speed 1/min : 190 (210)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

F20

#### APPLICATION

Rail car

: MAN-NR. 2-7906

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 13,8 a  
Edition : 10.02.89  
Replaces : 1.9.88  
Test oil : ISO-4113

Combination no. : 0 401 846 225

Injection pump  
Pump designation : PE6P120A720RS167  
EP type number : 0 411 826 053  
Governor  
Governor design. : RQ225/1100PA118  
Governor no. : 0 421 801 027

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 221A

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 9.00...12.00

F21

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 15.8

## Testing:

1st rack travel in: 10.10

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1195...1225

4th rack travel in: 1350

Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 7.6

#### Testing:

Speed rpm : 100

Minimum rack trave: 9.10

Speed rpm : 225

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00

Speed rpm : 365...405

#### TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.10...11.20

2nd speed rpm : 600

Rack travel in m: 11.10...11.30

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 13,8 a6  
Edition : 10.02.89  
Replaces : 3.83  
Test oil : ISO-4113

Combination no. : 0 401 846 356

Injection pump  
Pump designation : PE6P120A720RS167  
EP type number : 0 411 826 053  
Governor  
Governor design. : RQ225/1100PA323R  
Governor no. : 0 421 801 065

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 221A

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.10

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1190...1220

4th rack travel in: 1350



Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 7.6

#### Testing:

Speed rpm : 100

Minimum rack travel: 9.10

Speed rpm : 225

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00

Speed rpm : 365...405

#### TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.10...11.20

2nd speed rpm : 550

Rack travel in m: 11.10...11.30

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 13,8a10  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 365  
 Injection pump  
 Pump designation : PE6P120A72ORS167  
 EP type number : 0 411 826 053  
 Governor  
 Governor design. : RQ225/1100FA323  
 Governor no. : 0 421 801 065

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 221A

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.10

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1195...1225

4th rack travel in: 1350

Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 7.6

#### Testing:

Speed rpm : 100

Minimum rack trave: 9.10

Speed rpm : 225

Rack travel in mm : 7.50...7.70

Rack travel in mm : 2.00

Speed rpm : 365...405

#### TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.10...11.20

2nd speed rpm : 550

Rack travel in m: 11.10...11.30

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 13,8 c  
 Edition : 10.02.89  
 Replaces : 6.85  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 409  
 Injection pump  
 Pump designation : PE6P120A720RS214  
 EP type number : 0 411 826 060  
 Governor  
 Governor design. : RQV425...1050PA438  
 Governor no. : 0 421 813 273

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8215.22.520

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 10.10...10.20  
 Del.quantity cm3/ : 16.7...16.9  
 100 s: (16.4...17.2)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 425.0  
 Rack travel in mm : 6.2...6.4  
 Del.quantity cm3/ : 2.5...3.1  
 100 s: (2.2...3.4)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 425  
 travel mm : 1.20...1.40  
 2nd speed rpm : 600  
 travel mm : 3.80...4.60  
 3rd speed rpm : 900  
 travel mm : 6.40...6.70  
 4th speed rpm : 1050  
 travel mm : 7.60...7.80  
 5th speed rpm : 1400  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1115  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 167.0...169.0  
 1000 : (164.0...172.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 54...62

Testing:

1st rack travel in: 9.10

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1190...1220

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rpm : 100

Minimum rack travel: 7.80

Speed rpm : 425

Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 425...525

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.10

Speed rpm : 1090...1100

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

## STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 8,0 e 1  
Edition : 09.03.87  
Replaces : 7.84  
Test oil : ISO-4113

Combination no. : 0 401 846 423

Injection pump  
Pump designation : PE6P110A720RS393  
EP type number : 0 411 816 131  
Governor  
Governor design. : RQV250...1200PA469  
Governor no. : 0 421 813 226

Customer-spec. information  
Customer : SCANIA

Engine : DN8 01

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.5

100 s: (0.7)

2nd speed rpm : 225.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 1.1...1.5

100 s: (-)

Spread cm3 : 0.2

100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 200

travel mm : 0.70...0.90

2nd speed rpm : 500

travel mm : 3.00...3.50

3rd speed rpm : 800

travel mm : 5.10...5.30

4th speed rpm : 1200

travel mm : 8.20...8.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm3 : 5.00

1000 : (7.00)

## RATED SPEED

1st version

Control lever  
position degrees: 47...55

Testing:  
1st rack travel in: 11.00  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1325...1355  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 335...395

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1200  
Del. quantity cm<sup>3</sup>/ : 98.5...103.5  
1000 s: (96.0...106.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 140.0...190.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Del. quantity cm<sup>3</sup>/ : 11.0...15.0  
Spread cm<sup>3</sup> : 2.00  
1000 s: (4.00)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.

Permissible alteration from 2.20...2.90

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 22, 1983

Start of delivery - engine: 22° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 8,0 e  
Edition : 09.03.87  
Replaces : 7.84  
Test oil : ISO-4113

Combination no. : 0 401 846 424

Injection pump  
Pump designation : PE6P110A720RS393  
EP type number : 0 411 816 131  
Governor  
Governor design. : RQV200...1200PA467  
Governor no. : 0 421 813 224

Customer-spec. information  
Customer : SCANIA

Engine : DN8 01

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.5

100 s: (0.7)

2nd speed rpm : 225.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 1.1...1.5

100 s: (-)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm3 : 5.00

1000 : (7.00)

## RATED SPEED

1st version

Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11.00

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1365...1395

4th rack travel in: 1500

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 12...20



Testing:

Speed rpm : 100  
Minimum rack trave: 8.40  
Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 440...500

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1200  
Del.quantity cm3/ : 98.5...103.5  
1000 s: (96.0...106.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...190.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225  
Rack travel in mm : 6.90...7.10  
Del.quantity cm3/ : 11.0...15.0  
Spread cm3 : 2.00  
1000 s: (4.00)

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 22, 1983

Start of delivery - engine: 22° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 8,0 n 1  
Edition : 09.03.87  
Replaces : 7.84  
Test oil : ISO-4113

Combination no. : 0 401 846 479

Injection pump  
Pump designation : PE6P110A720RS393  
EP type number : 0 411 816 131  
Governor  
Governor design. : RQ750PA528  
Governor no. : 0 421 801 126

Customer-spec. information  
Customer : SCANIA

Engine : DN8 01

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.5

100 s: (0.7)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm3 : 5.00

1000 : (7.00)

## RATED SPEED

### 1st version

#### Testing:

1st rack travel in: 11.60

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 778...788

4th rack travel in: 1500

Speed rpm : 0.00...1.00

## LOW IDLE 1

#### Testing:

Speed rpm : 100

Rack travel in mm : 2.00

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 750...755

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...190.0  
Rack travel in mm : 20.00...21.00

Remarks:

:

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 22, 1983

Start of delivery - engine: 22° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : BET 8,8 b 1  
Edition : 10.02.89  
Replaces : 12.2.88  
Test oil : ISO-4113

Combination no. : 0 401 846 489

Injection pump  
Pump designation : PE6P120A320RS377  
EP type number : 0 411 826 108  
Governor  
Governor design. : RQV275...1200PA425-2  
Governor no. : 0 421 813 403

Customer-spec. information  
Customer : RVI

Engine : MIDS 062030

1st version kW : 158.1  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 15.0...15.2

100 s: (14.7...15.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 1.1...1.7  
100 s: (0.8...2.0)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 1.00...1.20  
2nd speed rpm : 425  
travel mm : 3.00...3.50  
3rd speed rpm : 900  
travel mm : 5.60...5.90  
4th speed rpm : 1200  
travel mm : 7.60...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1275  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 700  
Del.quantity : 150.0...152.0  
1000 : (147.0...155.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

#### Testing:

1st rack travel in: 11.60  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1375...1405  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 275  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 275...375

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.60...12.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.50...11.60  
2nd pressure hPa : 190  
Rack travel in m: 12.20...12.30  
3rd pressure hPa : 170  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 76.0...78.0  
1000 s: (73.0...81.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: -1.00  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -7.00...-7.20  
Del.quantity cm3/ : 11.0...17.0  
1000 s: (8.0...20.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 7,1 a 1  
 Edition : 10.02.89  
 Replaces : 12.9.86  
 Test oil : ISO-4113

Combination no. : 0 401 846 506

Injection pump  
 Pump designation : PE6P110A320RS483-1  
 EP type number : 0 411 816 160  
 Governor  
 Governor design. : RQV250...1200PA499-2  
 Governor no. : 0 421 813 461

Customer-spec. information  
 Customer : VOLVO

Engine : TD71FS

1st version kW : 180.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.20...1.30

2nd speed rpm : 300

travel mm : 1.70...2.00

3rd speed rpm : 400

travel mm : 2.50...2.80

4th speed rpm : 700

travel mm : 4.40...4.70

5th speed rpm : 1200

travel mm : 7.60...7.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 142.0...144.0

1000 : (139.0...147.0)

Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1385...1415  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 5...13

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 250  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 300...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 700  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 300  
Rack travel in m: 10.60...10.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm3/ : 134.0...138.0  
1000 s: (131.0...141.0)  
Aneroid pressure h: -  
Speed rpm : 700

Del.quantity cm3/ : 85.0...88.0  
1000 s: (82.0...91.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...200.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 16.0...20.0  
Spread cm3 : 3.00  
1000 s: (6.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : ENA 10,1 b  
Edition : 07.02.89  
Replaces : 25.3.88  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 546  
  
Injection pump  
Pump designation : PE6P100A820LS130  
EP type number : 0 411 806 179  
Governor  
Governor design. : RQV250...1050PA807-1  
Governor no. : 0 421 813 665

Customer-spec. information  
Customer : ENASA

Engine : 95 A1 BX

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 7.9...8.1

Del.quantity cm<sup>3</sup>/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.30

2nd speed rpm : 350  
travel mm : 1.60...2.20

3rd speed rpm : 700  
travel mm : 4.40...5.00

4th speed rpm : 1095  
travel mm : 7.90...8.10

5th speed rpm : 1185  
travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1030

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 41...49

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...400

#### START CUT-OUT

Speed 1/min : 170 (150)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Special-purpose vehicle

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : ENA 11,9 a1  
Edition : 24.02.89  
Replaces : 19.5.88  
Test oil : ISO-4113

Combination no. : 0 401 846 550

Injection pump  
Pump designation : PE6P120A320RS257  
EP type number : 0 411 826 075  
Governor  
Governor design. : RQV250...1050PA808  
Governor no. : 0 421 813 553

Customer-spec. information  
Customer : ENASA

Engine : 96 T1 CX

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.40

2nd speed rpm : 350  
travel mm : 1.70...2.30

3rd speed rpm : 700  
travel mm : 4.50...5.10

4th speed rpm : 1095  
travel mm : 8.20...8.40

5th speed rpm : 1175  
travel mm : 9.10...9.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1090

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1030

Aneroid pressure h: 900

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 48...56

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.20  
Speed rpm : 250  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 250...370

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 10.90...11.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 510  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 300  
Rack travel in m: 9.20...9.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 187.0...193.0  
1000 s: (184.0...196.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

#### APPLICATION

Special-purpose vehicle

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,0 y  
Edition : 21.05.87  
Replaces : 9.3.87  
Test oil : ISO-4113

Combination no. : 0 401 846 764

Injection pump  
Pump designation : PE6P110A72ORS3115  
EP type number : 0 411 816 735  
Governor  
Governor design. : RQV200...1100PA468  
Governor no. : 0 421 813 364

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DN11 01

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
: (3.25...3.45)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.5

100 s: (0.7)

2nd speed rpm : 225.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 2.0...2.4

100 s: (-)

Spread cm3 : 0.2

100 s: (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 0.90...1.00

2nd speed rpm : 360

travel mm : 2.60...2.90

3rd speed rpm : 560

travel mm : 4.30...4.60

4th speed rpm : 1150

travel mm : 8.40...8.60

5th speed rpm : 1250

travel mm : 9.50...9.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Del.quantity : 119.0...121.0

1000 : (117.0...123.0)

Spread cm3 : 5.00

1000 : (7.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:

1st rack travel in: 11.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 6...14

Testing:

Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 330...390

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 119.5...124.5  
1000 s: (118.0...126.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1140...1150

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
Spread cm<sup>3</sup> : 2.00  
1000 s: (4.00)

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on April 10, 1984

Start of delivery - engine: 21° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 12,2 c  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 046 797  
Injection pump  
Pump designation : PES6P120A320RS3212  
EP type number : 0 412 026 731  
Governor  
Governor design. : RQV250..1050PA794-2  
Governor no. : 0 421 813 698

Customer-spec. information  
Customer : PERKINS

Engine : EAGLE TX

1st version kW : 240.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : 5.9...6.1  
Del.quantity cm3/ : 1.3...1.7  
100 s: (1.0...2.0)  
Spread cm3 : 0.3  
100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.30  
2nd speed rpm : 350  
travel mm : 2.90...3.50  
3rd speed rpm : 700  
travel mm : 4.00...4.60  
4th speed rpm : 1000  
travel mm : 7.40...7.60  
5th speed rpm : 1100  
travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1070  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200

Del.quantity : 239.0...241.0  
1000 : (236.0...244.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 13.60  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 16...24

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.60...14.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.20...12.30  
2nd pressure hPa : 900  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 510  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 243.0...249.0  
1000 s: (240.0...252.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 a 2  
 Edition : 07.02.89  
 Replaces : 30.9.88  
 Test oil : ISO-4113

Combination no. : 0 402 046 800

Injection pump  
 Pump designation : PES6P110A720RS3140  
 EP type number : 0 412 016 716  
 Governor  
 Governor design. : RQV275...1100PA501-6  
 Governor no. : 0 421 813 711

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.21.202/206

1st version kW : 176.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 13.9...14.2

100 s: (13.6...14.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 6.8...7.0

Del.quantity cm<sup>3</sup>/ : 2.2...2.7

100 s: (1.9...2.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.00...1.20

2nd speed rpm : 400  
 travel mm : 2.70...3.00

3rd speed rpm : 850  
 travel mm : 5.00...5.20

4th speed rpm : 1100  
 travel mm : 6.80...7.00

5th speed rpm : 1500  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1260

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 139.0...142.0

1000 : (136.5...144.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)



## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

### Testing:

1st rack travel in: 10.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 11...19

### Testing:

Speed rpm : 100  
Minimum rack travel: 8.40  
Speed rpm : 275  
Rack travel in mm : 6.80...7.00

## CONSTANT REGULATION

Speed rpm : 280...525

Aneroid/Altitude  
Compensator Test

## 1st version

### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.30...11.40

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 280  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 260  
Rack travel in m: 10.30...10.50

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 104.0...107.0  
1000 s: (101.5...109.5)

## BREAKAWAY

## 1st version

G20

1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 1140...1150

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...170.0  
1000 s: (136.0...174.0)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 a12  
Edition : 04.11.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 046 802  
Injection pump  
Pump designation : PES6P110A820LS3131-1  
EP type number : 0 412 016 717  
Governor  
Governor design. : RQ300/1100PA722-2  
Governor no. : 0 421 801 459

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
: (4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 13.9...14.1

100 s: (13.6...14.3)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0  
Rack travel in mm : 7.2...7.4  
Del.quantity cm3/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm3 : 0.4  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 13.00...14.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 139.0...141.0  
1000 : (136.5...143.5)  
Spread cm3 : 4.00  
1000 : (8.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.00

Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.80  
Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 116.0...119.0  
1000 s: (113.0...122.0)  
Spread cm3 : 5.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

Remarks:

:

Adjust full-load delivery by turning  
temperature-dependent excess-fuel stop  
for starting (TAS).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 14,9 f1  
 Edition : 07.02.89  
 Replaces : 10.4.87  
 Test oil : ISO-4113

Combination no. : 0 402 048 046

Injection pump  
 Pump designation : PES8P120A320RS507  
 EP type number : 0 412 028 023  
 Governor  
 Governor design. : RQV275...1050PA665-2  
 Governor no. : 0 421 813 623

Customer spec. information  
 Customer : RVI

Engine : MIVR083530

1st version kW : 268.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 8- 4- 2- 7- 3-  
 : 6- 5

Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm3/ : 18.2...18.4  
 100 s: (17.9...18.7)

---

Spread cm3 : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.2...5.4  
 Del.quantity cm3/ : 1.9...2.5  
 100 s: (1.6...2.8)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 0.60...1.00  
 2nd speed rpm : 450  
 travel mm : 3.20...3.60  
 3rd speed rpm : 550  
 travel mm : 4.10...4.50  
 4th speed rpm : 700  
 travel mm : 5.00...5.40  
 5th speed rpm : 1050  
 travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 700

Del.quantity : 182.0...184.0  
1000 : (179.0...187.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 49...57

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1105...1115  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 16...24

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 275  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 300...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.00...11.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 150  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 110  
Rack travel in m: 9.80...10.00

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

1st version

G24

Aneroid pressure h: 700  
Speed rpm : 650  
Del.quantity cm3/ : 165.0...171.0  
1000 s: (162.0...174.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 116.0...118.0  
1000 s: (113.0...121.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: -1.00  
Speed rpm : 1105...1115

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (136.0...164.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : -5.20...-5.40  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (16.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:  
Start-of-delivery mark 13° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 9,4 a 4  
 Edition : 7.2.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 058 043  
 Injection pump  
 Pump designation : PES8P100A921/5RS286  
 Governor  
 Governor design. : RQV300...1300PA443KR

Customer-spec. information  
 Customer : IHC

Engine : DVT 800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45  
 Overflow valve : 1 417 413 040

Inlet press., bar : 2.70

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 9 681 230 713

Outside diameter  
 x Wall thickness  
 x Length mm : 1/4"x0.083"x40"

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)  
 Rack travel in mm : 10.50  
 Firing order : 1-8-4-2-7-3-6-5

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 12.20...12.30  
 Del.quantity cm3/ : 13.8...14.0  
 100 s : (-)  
 Spread cm3 : 0.4  
 100 s : (-)

2nd speed rpm : 300  
 Rack travel in mm : 5.00  
 Del.quantity cm3/ : 1.6...2.0  
 100 s : (-)  
 Spread cm3 : 0.5  
 100 s : (-)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1320  
 Rack travel in mm : 15.00...17.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 800  
 Del.quantity : 138.0...140.0  
 1000 : (-)  
 Spread cm3 : 4.0  
 1000 : (-)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 60.5...65.5

Testing:  
 1st rack travel in: 11.20  
 Speed rpm : 1340...1350  
 2nd rack travel in: 4.00  
 Speed rpm : 1450...1480  
 4th rack travel in: 1640  
 Speed rpm : 0.00...1.00

LOW IDLE 1  
 Control lever

position degrees: 8.5...13.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 425...485

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in mm : 12.15...12.25  
2nd speed rpm : 900  
Rack travel in mm : 11.70...11.80  
3rd speed rpm : 700  
Rack travel in mm : 11.20...11.30

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 800  
Pressure hPa : 160  
Rack travel mm : +0.50

##### Measurement

Speed 1/min : 800

1st pressure hPa : 620  
Rack travel in mm : 11.60...11.80

#### START CUT-OUT

Speed 1/min : 170...230

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 800  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 132.0...138.0  
1000 s: (-)  
Spread cm<sup>3</sup> : -  
1000 s: (-)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 89.0...97.0  
1000 s: (-)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 188.0...228.0  
1000 s: (-)

#### LOW IDLE

Speed rpm : 300  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (-)

#### Remarks:

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 n  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 075 700  
Injection pump  
Pump designation : PES5P110A720LS3221  
EP type number : 0 412 015 701  
Governor  
Governor design. : RSV350...1100POA487-  
7  
Governor no. : 0 421 833 314

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM449

1st version kW : 140.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X1.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
: (4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 13.5...13.7

100 s: (13.2...13.9)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0  
Rack travel in mm : 6.3...6.7  
Del.quantity cm3/ : 1.2...1.8  
100 s: (0.9...2.0)  
Spread cm3 : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 135.0...137.0

1000 : (132.5...139.5)

Spread cm3 : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 9.80

Speed rpm : 1130...1140

2nd rack travel in: 4.00



Speed rpm : 1190...1220  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.5  
Speed rpm : 350  
Rack travel in mm : 6.30...6.70  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 114.0...118.0  
1000 s: (111.0...121.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 L 2  
 Edition : 8.2.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 028  
 Injection pump  
 Pump designation : PES6P110A72ORS305  
 Governor  
 Governor design. : RSV400...1050P2/415D  
 R

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466 A

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.70  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.5 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 11.70...11.80  
 Del. quantity cm<sup>3</sup>/ : 16.0...16.2  
 100 s: (15.8...16.4)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (-)

2nd speed rpm : 400  
 Rack travel in mm : 6.20...6.40  
 Del. quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (-)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: 800  
 Speed rpm : -3  
 Rack travel in mm : 0.40...1.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 800  
 Del. quantity : 160.0...162.0  
 1000 : (158.0...164.0)  
 Spread cm<sup>3</sup> : 4.0  
 1000 : (-)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 40...48

Testing:  
 1st rack travel in: 10.70  
 Speed rpm : 1095...1105  
 2nd rack travel in: 6.00  
 Speed rpm : 1130...1170

## LOW IDLE 1

Control lever  
 position degrees: 17...25

Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.00...6.20

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 570...630

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 730  
Rack travel in m: 11.70...11.80  
3rd speed rpm : 650  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : 800  
Rack travel mm : 11.70...11.80

##### Measurement

Speed 1/min : 550

1st pressure hPa : 175 \*

#### START CUT-OUT

Speed 1/min : 350...450

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 800  
Speed rpm : 650  
Del.quantity cm3/ : 170.0...174.0  
1000 s: (168.0...176.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 88.0...96.0  
1000 s: (86.0...98.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70

Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0  
1000 s: (-)

#### HIGH IDLE

##### 1st version

Speed rpm : 1150  
Del.quantity cm3/ : 47.0...57.0  
1000 s: (-)

#### LOW IDLE

Speed rpm : 400  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (-)

#### Remarks:

\* Start of LDA (manifold-pressure  
compensator) movement

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 y 1  
Edition : 20.12.88  
Replaces : 30.9.88  
Test oil : ISO-4113

Combination no. : 0 402 076 722

Injection pump  
Pump designation : PES6P120A720RS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV400...1100P2A534  
Governor no. : 0 421 833 275

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466 HF-050

1st version kW : 194.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X3.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 15.6...15.8

100 s: (15.4...16.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 1.7...2.2  
100 s: (1.5...2.5)  
Spread cm3 : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 156.5...158.5

1000 : (154.0...161.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.00  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.80...13.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : 605  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 780  
Rack travel in m: 12.10...12.50  
3rd pressure hPa : 1200  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 174.5...179.5  
1000 s: (172.0...182.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 117.5...121.5  
1000 s: (114.5...124.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE32035  
Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 y  
Edition : 20.12.88  
Replaces : 30.9.88  
Test oil : ISO-4113

Combination no. : 0 402 076 723

Injection pump  
Pump designation : PES6P120A720RS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV400...1100P2A534-  
1  
Governor no. : 0 421 833 276

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466 AF-050

1st version kW : 180.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X3.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 15.0...15.2

100 s: (14.7...15.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 150.0...152.0

1000 : (147.5...154.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

#### Testing:

1st rack travel in: 10.80  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 700  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 720  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 895  
Rack travel in m: 11.80...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 173.5...178.5  
1000 s: (171.0...181.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 120.0...124.0  
1000 s: (117.0...127.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE32033

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 d 2  
 Edition : 07.02.89  
 Replaces : 7.3.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 725  
 Injection pump  
 Pump designation : PES6P110A82OLS3131-1  
 EP type number : 0 412 016 717  
 Governor  
 Governor design. : RSV350..1050POA487-5  
 Governor no. : 0 421 833 285

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 15.0...15.2

100 s: (14.7...15.4)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.0...7.3  
 Del.quantity cm3/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm3 : 0.4  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1030  
 Del.quantity : 150.0...152.0  
 1000 : (147.5...154.5)  
 Spread cm3 : 4.00  
 1000 : (8.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 43...51

Testing:  
 1st rack travel in: 11.50



Speed rpm : 1075...1085  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1350  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1075...1085

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 4.50  
1000 s: (7.00)

Remarks:

H08

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 b  
Edition : 20.12.88  
Replaces : 30.9.88  
Test oil : ISO-4113

Combination no. : 0 402 076 727

Injection pump  
Pump designation : PES6P120A72ORS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV400...1100P2A534-  
2  
Governor no. : 0 421 833 290

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076AF

1st version kW : 160.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

H09

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 13.4...13.6

100 s: (13.1...13.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 1.7...2.2  
100 s: (1.5...2.5)  
Spread cm3 : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 134.0...136.0

1000 : (131.5...138.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.10

Speed rpm : 1145...1155

2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 470  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 605  
Rack travel in m: 11.80...12.20  
3rd pressure hPa : 900  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 165.5...170.5  
1000 s: (163.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm3/ : 122.0...126.0  
1000 s: (121.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:  
: JOHN DEERE # RE32034

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 c  
Edition : 20.12.88  
Replaces : 30.9.88  
Test oil : ISO-4113

Combination no. : 0 402 076 728

Injection pump  
Pump designation : PES6P120A72ORS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV425...1050P2A489-  
2  
Governor no. : 0 421 833 291

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076 HRW01

1st version kW : 175.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X3.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.0...16.2

100 s: (15.7...16.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 425.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 1.7...2.2  
100 s: (1.5...2.5)  
Spread cm3 : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 160.0...162.0

1000 : (157.5...164.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

#### Testing:

1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1170  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 570...630

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 13.40...13.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 725  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 815  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 191.0...196.0  
1000 s: (188.5...198.5)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 157.0...161.0  
1000 s: (154.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE32888

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 g1  
 Edition : 20.12.88  
 Replaces : 30.9.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 731  
 Injection pump  
 Pump designation : PES6P110A72ORS3217  
 EP type number : 0 412 016 724  
 Governor  
 Governor design. : RSV400...1050P2A534-  
 4  
 Governor no. : 0 421 833 305

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6101 H

1st version kW : 224.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X3.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 21.2...21.4

100 s: (20.9...21.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 2.0...2.5

100 s: (1.8...2.8)

Spread cm3 : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 212.0...214.0

1000 : (209.5...216.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11.90

Speed rpm : 1090...1100

2nd rack travel in: 4.00  
Speed rpm : 1145...1155  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 560...620

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 325  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 640  
Rack travel in m: 12.90...13.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 228.0...233.0  
1000 s: (225.5...235.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 165.0...185.0  
1000 s: (160.0...190.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm3/ : 20.5...25.5  
1000 s: (18.0...28.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

#### Remarks:

: JOHN DEERE # RE36881

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 11,7 d 3  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 076 732  
  
Injection pump  
Pump designation : PES6P110A82OLS3131-1  
EP type number : 0 412 016 717  
Governor  
Governor design. : RSV350..1100POA487-6  
Governor no. : 0 421 833 311

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
: (4.25...4.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.1...14.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

2nd speed rpm : 350.0  
Rack travel in mm : 7.0...7.3  
Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del. quantity : 144.0...146.0

1000 : (141.5...148.5)

Spread cm<sup>3</sup> : 4.00

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.70



Speed rpm : 1130...1140  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 20...28  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 124.0...128.0  
1000 s: (121.0...131.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1130...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (126.0...154.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.00...7.30  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 4.50  
1000 s: (7.00)

Remarks:

H16

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MTU 26,5 b2  
 Edition : 9.2.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 438 028  
 Injection pump  
 Pump designation : PE8ZW160/120RS1027  
 /11  
 EP type number : 0 402 468 006  
 Governor  
 Governor design. : RQUV300...900ZWA67  
 Governor no. : 0 422 409 037

Customer-spec. information  
 Customer : MTU

Engine : 8V 331

1st version kW : 452.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 443 022

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 016

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.00X1500

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)  
 Rack travel in mm : 18.00

Firing order : 8-1-2-6-3-4-5-7

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.00

Del.quantity cm3/ : 23.0...24.0

100 s: (22.7...24.3)

Spread cm3 : 1.2

100 s: (1.8)

2nd speed rpm : 600

Rack travel in mm : 10.00

Del.quantity cm3/ : 19.0...21.0

100 s: (18.5...21.5)

Spread cm3 : 1.5

100 s: (2.2)

3rd speed rpm : 300

Rack travel in mm : 9.00

Del.quantity cm3/ : 7.2...9.2

100 s: (6.7...9.7)

Spread cm3 : 1.0

100 s: (1.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 900

Rack travel in mm : 18.00...18.10

## RATED SPEED

1st version

Control lever

position degrees: 75...83

## Testing:

1st rack travel in: 17.00

Speed rpm : 905...925

2nd rack travel in: 4.00

Speed rpm : 1000...1050

4th rack travel in: 1100

Speed rpm : 0.00...2.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 300

Rack travel in mm : 8.00

Control lever  
position degrees: 18...24

LOW IDLE 1  
Control lever  
position degrees: 18...24

Testing:  
Speed rpm : 200  
Minimum rack trave: 10.80  
Speed rpm : 400  
Rack travel in mm : 3.90...5.00  
Rack travel in mm : <0.01  
Speed rpm : 485...590

LOW IDLE 2  
Control lever  
position degrees: 24...30  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 8.00

Testing:  
Speed rpm : 200  
Rack travel in mm : 14.3...17.2  
Speed rpm : 300  
Rack travel in mm : 10.3...11.8  
Speed rpm : 500  
Rack travel in mm : 1.9...3.7

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 17.00  
Speed rpm : 905...925

#### Remarks:

Full-load delivery is set on engine  
according to engine test report.

## Note remarks

Combination no. : 0 402 638 804

Customer-spec. information  
Customer : PERKINS

1st version kW : 485.0  
Rated speed : 2100

Test oil  
inlet temp. °C : 38...42

Inlet press., bar : 1.50

Opening  
pressure, bar : 207...210

Test Lines : 1 680 750 067

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Test pressure, bar: 25...27

Time to cyl. no. : 1

1st speed      rpm : 900

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 31.0...31.2

100 s: (30.6...31.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

```
2nd speed      rpm : 300.0
Rack travel in mm : 5.0...5.4
Del.quantity   cm3/ : 2.2...2.8
               100 s: (1.9...3.1)
Spread         cm3 : 0.8
               100 s: (1.2)
```

(B) Setting of injection pump  
with governor

1st speed	rpm	: 300
travel mm		: 1.10...1.50
2nd speed	rpm	: 500
travel mm		: 3.40...3.80
3rd speed	rpm	: 800
travel mm		: 5.10...5.50
4th speed	rpm	: 1060
travel mm		: 7.70...7.90
5th speed	rpm	: 1185
travel mm		: 9.10...9.50

```
Control-lever position
Degree: -1
Speed      rpm : 1100
Rack travel in mm : 15.20...17.80
```

1st version  
Speed            rpm    : 900

Aneroid pressure h: 1200  
Del.quantity : 310.0...312.0  
1000 : (306.0...316.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 18...26

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.00...5.40

CONSTANT REGULATION  
Speed rpm : 300...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 850  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 700  
Rack travel in m: 11.70...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600

Del.quantity cm3/ : 317.0...323.0  
1000 s: (314.0...326.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 238.0...242.0  
1000 s: (236.0...244.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 a  
Edition : 10.2.89  
Replaces : 1.7.88  
Test oil : ISO-4113  
  
Combination no. : 0 402 640 811  
  
Injection pump  
Pump designation : PE12P120A520LS7812  
EP type number : 0 412 620 807  
Governor  
Governor design. : RQV250...1150PA860-1  
Governor no. : 0 421 813 692

Customer-spec. information  
Customer : MAN

Engine : D2842LYE

1st version kW : 735.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
: (4.85...5.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3  
: 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
Phasing : 345  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 28.9...29.1

100 s: (28.6...29.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 5.2...6.0 \*  
100 s: (-)  
3rd speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm3/ : - \*\*  
100 s: (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 2.00...2.40  
2nd speed rpm : 900  
travel mm : 6.70...7.10  
3rd speed rpm : 1150  
travel mm : 8.50...8.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1150  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 1300

Del.quantity : 289.0...291.0  
1000 : (286.0...294.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 63...71

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8..16

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 405...465

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 270  
Rack travel in m: 9.20...9.30  
3rd pressure hPa : 790  
Rack travel in m: 11.40...11.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0 \*  
1000 s: (-)

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : <8.00  
Del.quantity cm3/ : <50.0  
1000 s: (-)

Remarks:

:

\* applies to cylinders 4, 5, 6, 8, 10  
and 12  
\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 a1  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 813  
 Injection pump  
 Pump designation : PE12P120A520LS7812  
 EP type number : 0 412 620 807  
 Governor  
 Governor design. : RQV250...1150PA902-1  
 Governor no. : 0 421 813 728

Customer-spec. information  
 Customer : MAN

Engine : D2842LYE

1st version kW : 735.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
 : (4.85...5.05)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 28.9...29.1

100 s: (28.6...29.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm3/ : 5.2...6.0 \*

100 s: (-)

3rd speed rpm : 500  
 Rack travel in mm : <7.50  
 Del.quantity cm3/ : - \*\*  
 100 s: (-)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.10...1.50

2nd speed rpm : 500  
 travel mm : 3.80...4.20

3rd speed rpm : 850  
 travel mm : 8.50...8.90

4th speed rpm : 1150  
 travel mm : 9.50...9.70

5th speed rpm : 1400  
 travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1200  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



#### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1600  
Del.quantity : 289.0...291.0  
1000 : (286.0...294.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

#### 1st version

Control lever  
position degrees: 57...65

#### Testing:

1st rack travel in: 12.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1275...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

#### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.20...13.30

#### Measurement

Speed 1/min : 500

#### 1st pressure hPa : -

Rack travel in m: 8.90...9.10

#### 2nd pressure hPa : 500

Rack travel in m: 9.30...9.40

#### 3rd pressure hPa : 1150

Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

H24

#### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...120.0 \*  
1000 s: (-)

#### HIGH IDLE

#### 1st version

Speed rpm : 500  
Rack travel in mm : <8.00  
Del.quantity cm3/ : <50.0  
1000 s: (-)

#### 2nd version

Speed rpm : 500  
Rack travel in mm : 8.70  
Del.quantity cm3/ : 130.0  
1000 s: (-)

#### Remarks:

:

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

#### APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 21,0 a2  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 640 814  
Injection pump  
Pump designation : PE12P120A520LS7812  
EP type number : 0 412 620 807  
Governor  
Governor design. : RQV250...1150PA902  
Governor no. : 0 421 813 720

Customer-spec. information  
Customer : MAN

Engine : D2842LXE

1st version kW : 662.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
                  : (4.85...5.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
                  4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
                  180-225-240-285-300-  
Phasing : 345  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 24.9...25.1

100 s: (24.6...25.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 500.0  
Rack travel in mm : 8.7...8.9  
Del.quantity cm3/ : 14.1...14.7

100 s: (13.8...15.0)

Spread cm3 : 0.8  
100 s: (1.2)

3rd speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 5.2...6.0 \*

100 s: (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.10...1.50

2nd speed rpm : 500  
travel mm : 3.80...4.20

3rd speed rpm : 850  
travel mm : 8.50...8.90

4th speed rpm : 1150  
travel mm : 9.50...9.70

5th speed rpm : 1400  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 249.0...251.0  
1000 : (246.0...254.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version:

Control lever  
position degrees: 57...65

### Testing:

1st rack travel in: 11.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 18...26

### Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 12.20...12.30

## Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 270  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 790  
Rack travel in m: 11.30...11.70

## START CUT-OUT

Speed 1/min : 200 (220)

H26

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1190...1200

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

## HIGH IDLE

### 1st version

Speed rpm : 500\*\*  
Rack travel in mm : <7.50  
Del.quantity cm<sup>3</sup>/ : <0  
1000 s: (-)

### 2nd version

Speed rpm : 500\*\*  
Rack travel in mm : <8.00  
Del.quantity cm<sup>3</sup>/ : <50.0  
1000 s: (-)

### 3rd version

Speed rpm : 500  
Rack travel in mm : 8.70  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

:

\* applies to cylinders 4, 5, 6, 8, 10  
and 12  
\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : SCA 11,0 v2  
Edition : 24.07.87  
Replaces : 9.3.87  
Test oil : ISO-4113

Combination no. : 0 402 646 804

Injection pump  
Pump designation : PE6P120A720RS7004  
EP type number : 0 412 626 801  
Governor  
Governor design. : RQ900PA528  
Governor no. : 0 421 801 127

Customer-spec. information  
Customer : SAAB - SCANIA

Engine : DS11 43,44,45

### TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)

Rack travel in mm : 9.00...12.00

H28

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.6

100 s: (0.9)

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 207.0...209.0

1000 : (204.0...212.0)

Spread cm3 : 6.00

1000 : (9.00)

### RATED SPEED

1st version

Control lever

position degrees: 22...30

Testing:

1st rack travel in: 11.80

Speed rpm : 900...905

2nd rack travel in: 4.00

Speed rpm : 941...955

4th rack travel in: 1000

Speed rpm : 0.00...1.00

### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 240.0...290.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

### HIGH IDLE

1st version

Rack travel in mm : 4.90...5.10

Spread      cm<sup>3</sup> : 4.00  
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Oct. 17, 1988

Engine model DS 11 - 17° before top  
dead center.

Engine model DSI 11 - 16° before top  
dead center.

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 16,0 a  
 Edition : 10.02.89  
 Replaces : 24.7.87  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 832  
 Injection pump  
 Pump designation : PE6P130A72ORS7122  
 EP type number : 0 412 636 804  
 Governor  
 Governor design. : RQV225...930FA799  
 Governor no. : 0 421 813 544

Customer-spec. information  
 Customer : VOLVO

Engine : TD160

1st version kW : 343.0  
 Rated speed : 1860

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 27.4...27.7

100 s: (27.1...28.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 250.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 2.5...3.0

100 s: (2.3...3.3)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 2.10...2.70

3rd speed rpm : 700

travel mm : 6.40...6.60

4th speed rpm : 960

travel mm : 7.60...7.80

5th speed rpm : 1045

travel mm : 9.00...9.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1010

Rack travel in mm : 6.70...9.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 700

Del.quantity : 274.5...277.5  
1000 : (271.0...281.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 11.90  
Speed rpm : 960...972  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 5...13

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION  
Speed rpm : 225...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in mm: 9.70...9.80  
2nd pressure hPa : 80  
Rack travel in mm: 10.00...10.10  
3rd pressure hPa : 540  
Rack travel in mm: 12.50...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 182.5...185.5  
1000 s: (179.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 960...972

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
Rack travel in mm : 9.70...9.80

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 25.5...30.5  
1000 s: (23.0...33.0)  
Spread cm3 : 5.00  
1000 s: (8.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 b  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 836  
 Injection pump  
 Pump designation : PE6P120A72ORS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RQV200...1000PA725-1  
 Governor no. : 0 421 813 552

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC11 18

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.10...14.20

Del.quantity cm3/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.5...4.9

Del.quantity cm3/ : 1.5...1.9

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 1045

travel mm : 8.40...8.60

5th speed rpm : 1160

travel mm : 9.90...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 225  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 320...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 575  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 405  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 223.0...231.0  
1000 s: (221.0...233.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.50...4.70

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 16,0 b  
Edition : 10.02.89  
Replaces : 3.4.87  
Test oil : ISO-4113

Combination no. : 0 402 646 837

Injection pump  
Pump designation : PE6P130A720RS7134  
EP type number : 0 412 636 805  
Governor  
Governor design. : RQV225...930PA849  
Governor no. : 0 421 813 600

Customer-spec. information  
Customer : VOLVO

Engine : TD160

1st version kW : 320.0  
Rated speed : 1860

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 27.5...27.7

100 s: (27.1...28.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 225.0  
Rack travel in mm : 5.1...5.3  
Del.quantity cm3/ : 2.5...2.9  
100 s: (2.2...3.2)  
Spread cm3 : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 0.90...1.00  
2nd speed rpm : 440  
travel mm : 3.60...3.90  
3rd speed rpm : 750  
travel mm : 6.40...6.60  
4th speed rpm : 980  
travel mm : 7.90...8.10  
5th speed rpm : 1050  
travel mm : 9.20...9.40

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1010  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 700

Del.quantity : 275.0...277.0  
1000 : (271.0...281.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 975...985  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 5...13

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 225  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 225...390

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.90...13.00

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 100  
Rack travel in m: 10.00...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 182.0...186.0  
1000 s: (179.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 975...985

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (-)  
Rack travel in mm : 9.70...9.80

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.10...5.30  
Del.quantity cm3/ : 25.0...29.0  
1000 s: (22.0...32.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 d  
Edition : 10.02.89  
Replaces : 2.11.87  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 844  
  
Injection pump  
Pump designation : PE6P120A72ORS7017  
EP type number : 0 412 626 818  
Governor  
Governor design. : RQV200...1000PA539-7  
Governor no. : 0 421 813 631

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC 11 12

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 019  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 22.0...22.2

100 s: (21.7...22.5)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 5.3...5.7

Del.quantity cm3/ : 1.8...2.2

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 1.20...1.60

2nd speed rpm : 350  
travel mm : 2.40...3.00

3rd speed rpm : 650  
travel mm : 4.50...5.10

4th speed rpm : 1045  
travel mm : 8.40...8.60

5th speed rpm : 1165  
travel mm : 10.00...10.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 220.0...222.0

1000 : (217.0...225.0)

Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.70  
2nd pressure hPa : 480  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 285  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm3/ : 210.0...218.0  
1000 s: (208.0...220.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 169.0...173.0  
1000 s: (167.0...175.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.30...5.50

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 16° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 c  
 Edition : 10.02.89  
 Replaces : 5.2.88  
 Test oil : ISO-4113

Combination no. : 0 402 646 845

Injection pump  
 Pump designation : PE6P120A72ORS7139  
 EP type number : 0 412 626 819  
 Governor  
 Governor design. : RQV200...1000PA725-2  
 Governor no. : 0 421 813 632

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC11 13

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.20...15.30

Del.quantity cm3/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 5.3...5.7

Del.quantity cm3/ : 1.8...2.2

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60

2nd speed rpm : 350  
 travel mm : 2.40...3.00

3rd speed rpm : 650  
 travel mm : 4.40...5.00

4th speed rpm : 1045  
 travel mm : 8.40...8.60

5th speed rpm : 1170  
 travel mm : 10.10...10.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 236.0...238.0

1000 : (233.0...241.0)

Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 14.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.20...15.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.70  
2nd pressure hPa : 535  
Rack travel in m: 14.60...14.70  
3rd pressure hPa : 290  
Rack travel in m: 13.10...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm3/ : 226.0...234.0  
1000 s: (224.0...236.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 169.0...173.0  
1000 s: (167.0...175.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.30...5.50

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 e  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 846  
 Injection pump  
 Pump designation : PE6P120A720RS7018  
 EP type number : 0 412 626 821  
 Governor  
 Governor design. : RQV200...1000PA539-8  
 Governor no. : 0 421 813 635

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 73

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 19.2...19.4

100 s: (18.9...19.7)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 1.4...1.8

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60

2nd speed rpm : 350  
 travel mm : 2.40...3.00

3rd speed rpm : 650  
 travel mm : 4.50...5.10

4th speed rpm : 1045  
 travel mm : 8.40...8.60

5th speed rpm : 1150  
 travel mm : 9.80...10.20

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 192.0...194.0

1000 : (189.0...197.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 405  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 255  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 187.0...195.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 280.0...330.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 14° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 l  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 847

Injection pump  
Pump designation : PE6P120A32ORS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RGV200...1100PA712-2  
Governor no. : 0 421 813 636

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC9 02

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 18.4...18.6

100 s: (18.1...18.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 2.1...2.5

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 0.90...1.30

2nd speed rpm : 350  
travel mm : 2.50...3.10

3rd speed rpm : 650  
travel mm : 5.40...6.00

4th speed rpm : 1145  
travel mm : 8.90...9.10

5th speed rpm : 1290  
travel mm : 10.20...10.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 184.0...186.0

1000 : (181.0...189.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.90...13.00

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.90...11.30  
2nd pressure hPa : 345  
Rack travel in m: 12.40...12.50  
3rd pressure hPa : 175  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 179.0...187.0  
1000 s: (177.0...189.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (130.0...138.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 L 1  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 848  
 Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV200...1100PA712-3  
 Governor no. : 0 421 813 637

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 05

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...5.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 2.1...2.5

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 0.90...1.30

2nd speed rpm : 350  
 travel mm : 2.50...3.10

3rd speed rpm : 650  
 travel mm : 5.40...6.00

4th speed rpm : 1145  
 travel mm : 8.90...9.10

5th speed rpm : 1280  
 travel mm : 10.10...10.50

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 240  
Rack travel in m: 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 16,2 a  
Edition : 10.02.89  
Replaces : 2.6.87  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 849  
  
Injection pump  
Pump designation : PE6P130A720RS7137  
EP type number : 0 412 636 806  
Governor  
Governor design. : RQ750PA865  
Governor no. : 0 421 801 401

Customer-spec. information  
Customer : VOLVO

Engine : TID162 AG

1st version kW : 350.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 34.1...34.3

100 s: (33.8...34.6)

Spread cm3 : 0.5

100 s: (0.9)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Del.quantity : 341.0...343.0  
1000 : (338.0...346.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Testing:  
1st rack travel in: 10.40  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 777...790  
4th rack travel in: 840  
Speed rpm : 0.00...1.00

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.40  
Speed rpm : 750...755

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...310.0  
1000 s: (260.0...320.0)

HIGH IDLE

1st version

Speed rpm : 781  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

:

APPLICATION

Generator



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 16,2 a  
Edition : 10.02.89  
Replaces : 20.11.87  
Test oil : ISO-4113

Combination no. : 0 402 646 850

Injection pump  
Pump designation : PE6P130A720RS7140  
EP type number : 0 412 636 807  
Governor  
Governor design. : RQV250...900PA869  
Governor no. : 0 421 813 634

Customer-spec. information  
Customer : VOLVO-PENTA

Engine : TID 162 AP

1st version kW : 357.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 29.2...29.4

100 s: (28.8...29.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : 3.7...3.9  
Del.quantity cm3/ : 1.7...2.2  
100 s: (1.4...2.4)  
Spread cm3 : 0.5  
100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.30  
2nd speed rpm : 350  
travel mm : 2.00...2.60  
3rd speed rpm : 700  
travel mm : 4.40...5.00  
4th speed rpm : 925  
travel mm : 7.30...7.50  
5th speed rpm : 985  
travel mm : 8.10...8.50

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 980  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700

Del.quantity : 292.0...294.0  
1000 : (288.0...298.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

#### Testing:

1st rack travel in: 9.20  
Speed rpm : 920...925  
2nd rack travel in: 4.00  
Speed rpm : 970...1000  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.30  
Speed rpm : 250  
Rack travel in mm : 3.70...3.90

#### CONSTANT REGULATION

Speed rpm : 250...360

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 920...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...260.0  
1000 s: (-)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.70...3.90  
Del.quantity cm3/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm3 : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 f  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 854  
  
Injection pump  
Pump designation : PE6P120A72ORS7019  
EP type number : 0 412 626 823  
Governor  
Governor design. : RQ200/1000PA713-2  
Governor no. : 0 421 801 408

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS11 71

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 10.40

Speed rpm : 1045...1060

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 310...350

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.70  
2nd pressure hPa : 320  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 180  
Rack travel in m: 9.90...10.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 174.0...182.0  
1000 s: (172.0...184.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 112.0...116.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

See VDT-I-460/138.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Sep. 5, 1988

Start of delivery - engine: 14° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 g  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 855  
Injection pump  
Pump designation : PE6P120A72ORS7018  
EP type number : 0 412 626 821  
Governor  
Governor design. : RQ200/1000PA713-3  
Governor no. : 0 421 801 414

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS11 73

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 19.2...19.4

100 s: (18.9...19.7)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 1.4...1.8

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 192.0...194.0

1000 : (189.0...197.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 12.20

Speed rpm : 1045...1060

2nd rack travel in: 4.00

Speed rpm : 1190...1220

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 310...350

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.20...13.30

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 405  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 255  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 187.0...195.0  
1000 s: (185.0...197.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 280.0...330.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 14° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 16,2 b  
Edition : 10.02.89  
Replaces : 12.2.88  
Test oil : ISO-4113

Combination no. : 0 402 646 857

Injection pump  
Pump designation : PE6P130A720RS7150  
EP type number : 0 412 636 808  
Governor  
Governor design. : RQV250...900PA881  
Governor no. : 0 421 813 676

Customer-spec. information  
Customer : VOLVO-PENTA

Engine : TAMD 162 (HD)

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 29.7...29.9

100 s: (29.3...30.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0  
Rack travel in mm : 3.7...3.9  
Del.quantity cm3/ : 1.7...2.2  
100 s: (1.4...2.4)  
Spread cm3 : 0.5  
100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.90...1.30  
2nd speed rpm : 350  
travel mm : 2.00...2.60  
3rd speed rpm : 700  
travel mm : 4.40...5.00  
4th speed rpm : 925  
travel mm : 7.30...7.50  
5th speed rpm : 985  
travel mm : 8.10...8.50

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 980  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 900  
Del.quantity : 297.0...299.0  
1000 : (293.0...303.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

#### Testing:

1st rack travel in: 9.30  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 975...1005  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.30  
Speed rpm : 250  
Rack travel in mm : 3.70...3.90

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 10.30...10.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.70...7.90  
2nd pressure hPa : 310  
Rack travel in m: 7.90...8.00  
3rd pressure hPa : 660  
Rack travel in m: 9.90...10.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 192.0...196.0  
1000 s: (189.0...199.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 3.70...3.90  
Del.quantity cm<sup>3</sup>/ : 17.0...22.0  
1000 s: (14.5...24.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 h  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 858  
Injection pump  
Pump designation : PE6P120A72ORS7151  
EP type number : 0 412 626 824  
Governor  
Governor design. : RQ200/900PA713-4  
Governor no. : 0 421 801 424

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC11 04

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.8...5.2

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 0.00...15.20

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 7.6

## Testing:

1st rack travel in: 11.70

Speed rpm : 945...960

2nd rack travel in: 4.00

Speed rpm : 1050...1080

4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 225  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.70...12.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.40...11.80  
2nd pressure hPa : 395  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 290  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 171.0...179.0  
1000 s: (169.0...181.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 945...960

#### LOW IDLE

K01

Speed rpm : 225  
Rack travel in mm : 4.80...5.00

#### Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Sep. 5, 1988

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 l 2  
 Edition : 07.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 860  
 Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV350...1100PA795-1  
 Governor no. : 0 421 813 693

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 52,53,54,55

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.3...4.9

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.7)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.70

2nd speed rpm : 650  
 travel mm : 4.10...4.70

3rd speed rpm : 1145  
 travel mm : 7.80...8.00

4th speed rpm : 1255  
 travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1180

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 42...50

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1100  
Del. quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.30...4.90  
Del. quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.0...27.0)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

Remarks:

K03

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Oct. 17, 1988

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 L 3  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 861  
Injection pump  
Pump designation : PE6P120A320RS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RQV300....925PA712-4  
Governor no. : 0 421 813 701

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS9 52,53,54,55

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 019  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.0

Del.quantity cm3/ : 2.0...2.4

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.40...1.80

2nd speed rpm : 350  
travel mm : 1.90...2.50

3rd speed rpm : 650  
travel mm : 4.70...5.30

4th speed rpm : 970  
travel mm : 8.40...8.60

5th speed rpm : 1045  
travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 970

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:

1st rack travel in: 11.20

Speed rpm : 965...975

2nd rack travel in: 4.00

Speed rpm : 1030...1060

4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed rpm : 100

Minimum rack travel: 6.20

Speed rpm : 300

Rack travel in mm : 4.60...4.80

Rack travel in mm : 2.00

Speed rpm : 330...390

## FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100

Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 965...975

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)

Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.60...4.80

Remarks:

:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

## ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-12

Start of delivery - engine: 13° before TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a 2  
Edition : 28.11.88  
Replaces : 6.86  
Test oil : ISO-4113

Combination no. : 0 402 648 817

Injection pump  
Pump designation : PE8P120A320LS7801  
EP type number : 0 412 628 806  
Governor  
Governor design. : RQ300/1050PA762-5  
Governor no. : 0 421 801 399

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm3/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 650

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70  
5th pressure hPa : 1050  
Rack travel in m: 14.40...14.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm3/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 b 1  
Edition : 03.03.89  
Replaces : 12.9.86  
Test oil : ISO-4113

Combination no. : 0 402 648 825

Injection pump  
Pump designation : PE8P120A320LS7801  
EP type number : 0 412 628 806  
Governor  
Governor design. : RQV300..1050PA797-3  
Governor no. : 0 421 813 627

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 260.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm3/ : 20.3...20.5  
100 s: (20.0...20.8)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.0...6.4  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.40  
2nd speed rpm : 600  
travel mm : 4.90...5.10  
3rd speed rpm : 1075  
travel mm : 7.40...7.60  
4th speed rpm : 1100  
travel mm : 8.00...8.20  
5th speed rpm : 1150  
travel mm : 9.00...9.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1125  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 650  
Del.quantity : 203.0...205.0  
1000 : (200.0...208.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 1.40  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60

K09

2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30  
4th pressure hPa : -  
Rack travel in m: 11.30...11.60  
5th pressure hPa : 1050  
Rack travel in m: 14.30...14.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm3/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,0 h1  
 Edition : 07.02.89  
 Replaces : 15.1.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 836  
 Injection pump  
 Pump designation : PE8P120A920/4LS7125T  
 EP type number : 0 412 628 824  
 Governor  
 Governor design. : RQV200...950PA736-4  
 Governor no. : 0 421 813 646

Customer spec. information  
 Customer : SAAB-SCANIA

Engine : DSC14 03 L09,L10

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.30...2.90

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 995

travel mm : 7.70...7.90

5th speed rpm : 1125

travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 445  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 325  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 211.0...219.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 138.0...142.0  
1000 s: (136.0...144.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

:  
Test specifications approved by Scania  
on 1987-12-15

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,0 h2  
Edition : 07.02.89  
Replaces : 29.1.88  
Test oil : ISO-4113

Combination no. : 0 402 648 839

Injection pump  
Pump designation : PE8P120A920/4LS7125T  
EP type number : 0 412 628 824  
Governor  
Governor design. : RQV200...950PA736-1  
Governor no. : 0 421 813 551

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC14 03

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
6- 8

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 1.20...1.60

2nd speed rpm : 350  
travel mm : 2.30...2.90

3rd speed rpm : 650  
travel mm : 4.40...5.00

4th speed rpm : 995  
travel mm : 7.70...7.90

5th speed rpm : 1125  
travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.90...12.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 211.0...219.0  
1000 s: (209.0...221.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:

Test specifications approved by Scania  
on 1987-12-15

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 j  
Edition : 07.02.89  
Replaces : 8.6.88  
Test oil : ISO-4113

Combination no. : 0 402 648 844

Injection pump  
Pump designation : PE8P120A320LS7816  
EP type number : 0 412 628 829  
Governor  
Governor design. : RQ300/1050PA717-2  
Governor no. : 0 421 801 439

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 234.0...237.0

1000 : (231.0...240.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600



Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : -  
Rack travel in m: 9.90...10.20  
5th pressure hPa : 1500  
Rack travel in m: 14.80...15.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 263.0...267.0  
1000 s: (260.0...270.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : WAU 24,0 a  
Edition : 17.02.89  
Replaces : 5.8.88  
Test oil : ISO-4113

Combination no. : 0 402 648 847

Injection pump  
Pump designation : PE8P130A920/4RS7158  
EP type number : 0 412 638 801  
Governor  
Governor design. : RQV350...900PA760-1  
Governor no. : 0 421 813 617

Customer-spec. information  
Customer : WAUKESHA

Engine : H24DS/DSI

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00

K17

Firing order : 1- 4- 2- 6- 8- 5  
- 7- 3

Phasing : 0-45-090-135-180-225  
-270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 36.8...37.1

100 s: (26.5...37.5)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 4.2...4.4

Del.quantity cm3/ : 1.5...2.1

100 s: (1.1...2.5)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.50...1.80

2nd speed rpm : 700

travel mm : 5.30...5.70

3rd speed rpm : 950

travel mm : 8.40...8.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 950

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 368.5...371.5

1000 : (265.0...375.0)

Spread cm3 : 6.00

1000 : (10.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.70  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 5...13

Testing:  
Speed rpm : 100  
Minimum rack trave: 5.80  
Speed rpm : 350  
Rack travel in mm : 4.20...4.40

CONSTANT REGULATION  
Speed rpm : 350...450

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 940...950

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.20...4.40  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (11.0...25.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:  
:

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : WAU 24,0 a1  
Edition : 17.02.89  
Replaces : 5.8.88  
Test oil : ISO-4113  
Combination no. : 0 402 648 848  
Injection pump  
Pump designation : PE8P130A920/4RS7158  
EP type number : 0 412 638 801  
Governor  
Governor design. : RQ350/925PA892  
Governor no. : 0 421 801 441

Customer-spec. information  
Customer : WAUKESHA

Engine : H24DS/DSI

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 2- 6- 8- 5  
: - 7- 3

Phasing : 0-45-090-135-180-225  
-270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 36.8...37.1

100 s: (36.5...37.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 4.2...4.4

Del.quantity cm<sup>3</sup>/ : 1.5...2.1

100 s: (1.1...2.5)

Spread cm<sup>3</sup> : 1.0

100 s: (1.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Del.quantity : 368.5...371.5

1000 : (365.0...375.0)

Spread cm<sup>3</sup> : 6.00

1000 : (10.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

## Testing:

1st rack travel in: 10.70

Speed rpm : 970...985

2nd rack travel in: 4.00

Speed rpm : 1040...1070

4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 100  
Minimum rack trave: 5.80  
Speed rpm : 350  
Rack travel in mm : 4.20...4.40  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 970...985

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.20...4.40  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (11.0...25.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:

:

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 o  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 855

Injection pump  
Pump designation : PE8P120A320LS7823  
EP type number : 0 412 628 835  
Governor  
Governor design. : RQV350..1050PA870-5  
Governor no. : 0 421 813 735

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 13.60...13.80  
Del.quantity cm3/ : 23.4...23.7  
100 s: (23.1...24.0)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.9...6.5  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.90...2.10  
2nd speed rpm : 800  
travel mm : 4.90...5.20  
3rd speed rpm : 1100  
travel mm : 7.90...8.30  
4th speed rpm : 1175  
travel mm : 9.30...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1100  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 234.0...237.0  
1000 : (231.0...240.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 18...26

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 1050  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 1350  
Rack travel in m: 14.50...14.70

4th pressure hPa : 1500  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 9.90...10.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 263.0...267.0  
1000 s: (260.0...270.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 13.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a11  
Edition : 03.03.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 859

Injection pump  
Pump designation : PE8P120A320LS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RQV350...950PA866-4  
Governor no. : 0 421 813 737

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442 A

1st version kW : 264.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 930

Rack travel in mm : 15.30...15.40

Del.quantity cm3/ : 20.6...20.8

100 s: (20.3...21.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 6.2...6.6  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.40...1.60  
2nd speed rpm : 425  
travel mm : 2.40...2.60  
3rd speed rpm : 800  
travel mm : 5.30...5.60  
4th speed rpm : 1000  
travel mm : 7.80...8.20  
5th speed rpm : 1100  
travel mm : 9.40...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1000  
Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 930  
Aneroid pressure h: 950  
Del.quantity : 206.0...208.0  
1000 : (203.0...211.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 14.40  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 18...26

Testing:  
Speed rpm : 250  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 15.30...15.40  
2nd speed rpm : 800  
Rack travel in m: 16.40...16.60  
3rd speed rpm : 900  
Rack travel in m: 15.90...16.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.90...11.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 450

Rack travel in m: 11.70...11.90  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 950  
Speed rpm : 800  
Del.quantity cm3/ : 233.0...237.0  
1000 s: (230.0...240.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 950  
Speed rpm : 930  
Del.quantity cm3/ : 167.0...169.0 \*  
1000 s: (164.0...172.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 18,3 m 1  
Edition : 07.02.89  
Replaces : 2.9.88  
Test oil : ISO-4113

Combination no. : 0 402 649 804

Injection pump  
Pump designation : PE10P120A320LS7809-1  
EP type number : 0 412 629 801  
Governor  
Governor design. : RQV300..1050PA797-6  
Governor no. : 0 421 813 705

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM443 A

1st version kW : 331.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 130...150

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 10- 9- 4- 1- 8- 7  
- 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
216-261-288-333  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1050  
Rack travel in mm : 13.30...13.40  
Del.quantity cm3/ : 18.7...19.0  
100 s: (18.4...19.3)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.5...6.8  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.40  
2nd speed rpm : 600  
travel mm : 4.90...5.20  
3rd speed rpm : 800  
travel mm : 5.80...6.20  
4th speed rpm : 1025  
travel mm : 8.50...9.00  
5th speed rpm : 1175  
travel mm : 9.50...10.10

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1100  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 187.0...190.0  
1000 : (184.0...193.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 53...61

Testing:

1st rack travel in: 12.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 19...27

Testing:

Speed rpm : 200  
Minimum rack trave: 8.60  
Speed rpm : 300  
Rack travel in mm : 6.50...6.80

CONSTANT REGULATION

Speed rpm : 300...400

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 750  
Rack travel in m: 14.20...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 550

K26

Rack travel in m: 13.50...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 198.0...202.0  
1000 s: (195.0...205.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 18,3 p  
Edition : 07.02.89  
Replaces : 26.8.88  
Test oil : ISO-4113

Combination no. : 0 402 649 805

Injection pump  
Pump designation : PE10P120A320LS7817  
EP type number : 0 412 629 803  
Governor  
Governor design. : RQ300/1250PA856-1  
Governor no. : 0 421 801 449

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM443 LA

1st version kW : 400.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 130...150

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
                  : (3.95...4.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 10- 9- 4- 1- 8- 7  
                  - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
                  216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.50...15.70

Del.quantity cm3/ : 22.4...22.6  
100 s: (22.1...22.9)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.6...6.8  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1050  
Del.quantity : 224.0...226.0  
1000 : (221.0...229.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.40  
Speed rpm : 1295...1310  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1500  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

2nd speed rpm : 1250  
Rack travel in m: 15.40...15.60  
3rd speed rpm : 800  
Rack travel in m: 16.10...16.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 16.10...16.30

Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 13.20...13.40  
2nd pressure hPa : 750  
Rack travel in m: 15.20...15.40  
3rd pressure hPa : 1250  
Rack travel in m: 16.20...16.40  
4th pressure hPa : 1500  
Rack travel in m: 16.60...16.80  
5th pressure hPa : -  
Rack travel in m: 11.50...11.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1250  
Del.quantity cm3/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 235.0...239.0  
1000 s: (232.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 129.0...131.0  
1000 s: (126.0...134.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.40  
Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 230.0...250.0  
1000 s: (226.0...254.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 18,2 d1  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 649 807  
  
Injection pump  
Pump designation : PE10P120A520LS7811  
EP type number : 0 412 629 802  
Governor  
Governor design. : RQV250...1150PA902  
Governor no. : 0 421 813 720

Customer-spec. information  
Customer : MAN

Engine : D 2840 LX

1st version kW : 603.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00  
: (4.85...5.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 10- 9- 4- 1- 8- 7  
- 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
216-261-288-333  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 28.4...28.6

100 s: (28.1...28.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 500.0  
Rack travel in mm : 8.7...8.9  
Del.quantity cm3/ : 14.1...14.7  
100 s: (13.8...15.0)

Spread cm3 : 0.8  
100 s: (1.2)

3rd speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm3/ : 5.3...6.0 \*\*  
100 s: (-)

Spread cm3 : -  
100 s: (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.10...1.50

2nd speed rpm : 500  
travel mm : 3.80...4.20

3rd speed rpm : 850  
travel mm : 8.50...8.90

4th speed rpm : 1150  
travel mm : 9.50...9.70

5th speed rpm : 1400  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 284.0...286.0  
1000 : (281.0...289.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 79...87

##### Testing:

1st rack travel in: 12.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1345...1375  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 18...26

##### Testing:

Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.30...13.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 500  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 1150  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0\*\*  
1000 s: (-)

#### HIGH IDLE

##### 1st version

Speed rpm : 500 \*  
Rack travel in mm : 7.20...7.40  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (-)

##### 2nd version

Speed rpm : 500  
Rack travel in mm : 8.00...8.20  
Del.quantity cm<sup>3</sup>/ : 10.0...130.0

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*\*  
1000 s: (-)

#### Remarks:

:

\* applies to cylinders 1, 2, 3, 7 and 9  
\*\* applies for cylinders 4, 5, 6, 8 and 10

#### APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 18,3 L 2  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 649 808

Injection pump  
Pump designation : PE10P120A320LS7809-1  
EP type number : 0 412 629 801  
Governor  
Governor design. : RQ300/1050PA762-6  
Governor no. : 0 421 801 471

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM443 A

1st version kW : 331.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 130...150

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 10- 9- 4- 1- 8- 7  
: - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 18.5...18.7

100 s: (18.2...19.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 185.0...187.0

1000 : (182.0...190.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600



Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:

Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.70...7.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 750  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 550  
Rack travel in m: 13.50...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 750

Del.quantity cm3/ : 202.0...205.0  
1000 s: (199.0...208.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 129.0...131.0  
1000 s: (126.0...134.0)  
Spread cm3 : 8.00  
1000 s: (-)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

Note remarks

Combination no. : 0 402 670 804

Customer-spec. information  
Customer : DAIMLER-BENZ

1st version kW : 441.0  
Rated speed : 1500

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Test pressure, bar: 25...27

```
Prestroke mm      : 5.20...5.30
                   : (5.15...5.35)
Rack travel in mm  : 19.00...21.00
Firing order       : 12- 1- 5- 9- 8- 3-
                   : 4- 11- 10- 2- 6- 7
```

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance  $\pm$  <sup>0.50</sup> : 0.50 (0.75)

Time to cyl. no. : 12

1st speed      rpm : 700

Rack travel in mm : 15.90...16.00

Del.quantity cm<sup>3</sup>/ : 26.7...26.9

100 s: (26.4...27.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

```
2nd speed      rpm : 350.0
Rack travel in mm : 5.1...5.3
Del.quantity   cm3/ : 1.4...2.0
                100 s : (1.1...2.3)
Spread         cm3 : 0.8
                100 s : (1.2)
```

## Control-lever position

Degree:  $-3$

Speed rpm : 800  
Rack travel in mm : 0.30...1.40

Governor spring pre-tension  
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

```

1st version
Speed      rpm      : 700
Del.quantity 1000    : (267.0...269.0)
Spread      cm3      : 5.00
              1000    : (9.00)

```

RATED SPEED

1st version

Control lever  
position degrees: 20...28

Testing:

1st rack travel in: 14.90  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 900  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.2  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 21,9 y 3  
Edition : 09.12.88  
Replaces : 8.6.88  
Test oil : ISO-4113

Combination no. : 0 402 670 806

Injection pump  
Pump designation : PE12P120A320LS7807-2  
EP type number : 0 412 620 812  
Governor  
Governor design. : RSV350..1050POA538  
Governor no. : 0 421 833 300

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 444 A

1st version kW : 390.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 17.2...17.4

100 s: (16.9...17.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.7...6.0  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 900

Del.quantity : 172.0...174.0  
1000 : (169.0...177.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 36...44

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.50  
Speed rpm : 350  
Rack travel in mm : 5.70...6.00

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 875  
Rack travel in m: 13.40...13.60  
4th speed rpm : 750  
Rack travel in m: 13.90...14.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 500  
Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 k  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 676 805  
Injection pump  
Pump designation : PE6P120A32ORS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RSV350...1100P1A512  
Governor no. : 0 421 833 196

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS9 52,53,54,55

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

L09

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 4.5...4.9  
Del.quantity cm3/ : 2.0...2.4  
100 s: (-)  
Spread cm3 : 0.3  
100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 62...70

## Testing:

1st rack travel in: 11.20

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1200...1230

4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 26...384  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 445...505

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1100  
Del. quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 270.0...320.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

#### Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

L10

diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-12

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 g  
Edition : 29.2.88  
Replaces : 1.9.87  
Test oil : ISO-4113  
  
Combination no. : 0 402 678 802  
  
Injection pump  
Pump designation : PE8P120A320LS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RSV650...1050PDA826  
Governor no. : 0 421 833 253

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 234.0  
Rated speed : 2100  
2nd version kW : 234.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0.8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 650.0

Rack travel in mm : 4.1...4.3

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 34...42

Testing:  
1st rack travel in: 10.60  
Speed rpm : 1110...1120  
2nd rack travel in: 4.00  
Speed rpm : 1135...1150  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 650  
Rack travel in mm : 4.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 650  
Rack travel in mm : 4.20  
Rack travel in mm : 2.00  
Speed rpm : 650...710

SET IDLE AUXILIARY SPRING  
Speed rpm : 2.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1080  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 900  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 1000  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm<sup>3</sup> : 8.0  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1110...1120

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Engine-speed difference between 1 mm  
regulated and control-rod travel 4 mm =  
25...35 1/min.

In order to adjust and test the EP com-  
bination, set full-load speed regul.  
at 1110...1120 1/min. Then set speed  
regul. to 1060...1070 1/min again.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 g 1  
Edition : 28.11.88  
Replaces : 2.11.87  
Test oil : ISO-4113

Combination no. : 0 402 678 803

Injection pump  
Pump designation : PE8P120A32OLS7801-1  
EP type number : 0 412 628 818  
Governor  
Governor design. : RSV350...750POA825-3  
Governor no. : 0 421 833 260

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM442A

1st version kW : 240.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (4.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.10...15.20

Del.quantity cm3/ : 23.3...23.5

100 s: (23.0...23.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 233.0...235.0

1000 : (230.0...238.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 24...32

Testing:

1st rack travel in: 14.10  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 900  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 15.00  
Speed rpm : 350  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 350...410

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

2nd speed rpm : 900  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 1000  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 230.0...250.0  
1000 s: (226.0...254.0)

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

6- 8

## Note remarks

Test sheet : SCA 14,2 c2  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 678 807  
  
Injection pump  
Pump designation : PE8P120A920/4LS7002  
EP type number : 0 412 628 800  
Governor  
Governor design. : RSV350...1000P1/484-  
1  
Governor no. : 0 421 833 278  
  
Customer-spec. information  
Customer : SAAB-SCANIA

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 019  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 7- 3- 4- 5-

L15

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)  
  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
  
Rack travel in mm : 13.20...13.30  
  
Del.quantity cm3/ : 18.7...18.9  
100 s: (18.4...19.2)  
  
Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 4.7...5.2  
Del.quantity cm3/ : 1.4...1.8  
100 s: (-)  
Spread cm3 : 0.3  
100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Del.quantity : 187.0...189.0  
1000 : (184.0...192.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140

4th rack travel in: 1300  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 440...500

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 184.0...192.0  
1000 s: (182.0...194.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90

Remarks:  
: DS14 06,07  
: DS14 40,42  
: DSI14 40,41

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine:  
DS 14 - 18° before TDC  
DSI 14 - 17° before TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,0 i  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 678 811  
Injection pump  
Pump designation : PE8P120A920/4LS7125  
EP type number : 0 412 628 833  
Governor  
Governor design. : RSV350...1050P1A512-  
1  
Governor no. : 0 421 833 306

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS 14

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 7- 3- 4- 5-  
6- 8

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 4.6...5.0  
Del.quantity cm3/ : 1.5...1.9

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:

1st rack travel in: 12.50

Speed rpm : 1090...1100

2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1280  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 14...22  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 203.0...211.0  
1000 s: (201.0...213.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack travel: 12.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.60...4.80

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### ADDITIONAL INFORMATION

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 28, 1988

Engine firing sequence: 1-5-4-2-6-3-7-8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a11  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 736 800

Injection pump  
Pump designation : PES6P120A720/3RS7135  
-1

EP type number : 0 412 726 818  
Governor  
Governor design. : RQV325..1050PA848-  
20K  
Governor no. : 0 421 815 203

Customer-spec. information  
Customer : MACK

Engine : EM6 300 2VH

1st version kW : 224.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 9 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

L19

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
Rack travel in mm : 12.90...13.00  
Del.quantity cm3/ : 19.9...20.1  
100 s: (19.6...20.4)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 3.8...4.4  
100 s: (3.6...4.6)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 2.50...2.80  
3rd speed rpm : 800  
travel mm : 4.80...5.00  
4th speed rpm : 1050  
travel mm : 7.30...7.60  
5th speed rpm : 1200  
travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version



Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 275  
Minimum rack trave: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 325...600

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 630  
Rack travel in m: 13.00...13.10  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.60

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 630  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

##### Measurement

Speed 1/min : 630

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 190  
Rack travel in m: 9.10...9.20

3rd pressure hPa : 410  
Rack travel in m: 11.40...11.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 630  
Del.quantity cm3/ : 213.0...219.0  
1000 s: (210.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 121.0...125.0  
1000 s: (119.0...127.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...150.0  
1000 s: (100.0...160.0)  
Rack travel in mm : 7.80...8.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 o  
Edition : 03.03.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 745 806  
  
Injection pump  
Pump designation : PES5P120A720LS7163  
EP type number : 0 412 725 803  
Governor  
Governor design. : RQ300/1050PA774-4  
Governor no. : 0 421 801 453

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM429 LA

1st version kW : 221.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 23.5...23.7  
100 s: (23.2...24.0)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.6...5.9  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 800  
Del.quantity : 235.0...237.0  
1000 : (232.0...240.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 12.00  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 13.00  
Speed rpm : 0.00...1.50

### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

### Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 5.60...5.90  
Rack travel in mm : 2.00  
Speed rpm : 370...410

### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.00...13.20  
2nd speed rpm : 750  
Rack travel in m: 14.40...14.60

### Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

### Measurement

Speed 1/min : 600  
1st pressure hPa : 200  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 450  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80  
4th pressure hPa : 1400  
Rack travel in m: 14.40...14.60  
5th pressure hPa : -  
Rack travel in m: 10.00...10.40

### START CUT-OUT

Speed 1/min : 220 (240)

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1400  
Speed rpm : 1050  
Del.quantity cm3/ : 228.0...231.0  
1000 s: (225.0...234.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1400  
Speed rpm : 750  
Del.quantity cm3/ : 250.0...254.0  
1000 s: (247.0...257.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

### BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 1095...1110

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

### Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 810  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848K  
 Governor no. : 0 421 815 168

Customer-spec. information  
 Customer : MACK

Engine : E6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.0...4.2  
 Del.quantity cm3/ : 3.2...3.8  
 100 s: (3.0...4.0)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 236.5...238.5  
 1000 : (233.5...241.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.50  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a1  
 Edition : 07.02.89  
 Replaces : 8.4.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 814  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-1K  
 Governor no. : 0 421 815 169

Customer-spec. information  
 Customer : MACK

Engine : E6-300 4VH

1st version kW : 224.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm3/ : 3.2...3.8  
 100 s: (3.0...4.0)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 200.5...202.5  
 1000 : (197.5...205.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a2  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 815  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-2K  
 Governor no. : 0 421 815 170

Customer-spec. information  
 Customer : MACK

Engine : E6-275 4VH

1st version kW : 202.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm3/ : 3.2...3.8  
 100 s: (3.0...4.0)

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)



Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360

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Rack travel in m: 11.50...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (142.0...150.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a3  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 816  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-3K  
 Governor no. : 0 421 815 171

Customer-spec. information  
 Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm3/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 163.0...165.0  
 1000 : (160.0...168.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435

Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a4  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 817

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848-4K  
 Governor no. : 0 421 815 173

Customer-spec. information  
 Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 241.5...243.5

1000 : (238.5...246.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 13.60  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.44  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 625  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.80  
4th speed rpm : 500  
Rack travel in m: 0.00...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 14.90...15.10

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650

MO4

Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 265.0...271.0  
1000 s: (262.0...274.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...160.0  
1000 s: (110.0...170.0)  
Rack travel in mm : 8.10...8.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a5  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 818  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-5K  
 Governor no. : 0 421 815 174

Customer-spec. information  
 Customer : MACK

Engine : EM6-275L 4VH

1st version kW : 202.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm3/ : 3.7...4.3  
 100 s: (3.5...4.5)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1110  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 190.0...192.0  
 1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a6  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 819

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-6K  
 Governor no. : 0 421 815 175

Customer-spec. information  
 Customer : MACK

Engine : EM6-225L 4VH

1st version kW : 165.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

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Rack travel in mm : 11.00...11.10

---

Del.quantity cm3/ : 15.8...16.0

---

100 s: (15.5...16.3)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm3/ : 3.8...4.4  
 100 s: (3.6...4.6)

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1110  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 158.5...160.5  
 1000 : (155.5...163.5)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 600  
Rack travel in m: 12.50...12.70  
4th speed rpm : 700  
Rack travel in m: 11.80...12.00  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220

M08

Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 131.0...135.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b5  
Edition : 07.02.89  
Replaces : 7.10.88  
Test oil : ISO-4113

Combination no. : 0 402 746 820

Injection pump  
Pump designation : PES6P120A720RS7135  
EP type number : 0 412 726 807  
Governor  
Governor design. : RQV325...850PA878K  
Governor no. : 0 421 815 177

Customer-spec. information  
Customer : MACK

Engine : E6-275 4VH

1st version kW : 202.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.5...4.7  
Del.quantity cm3/ : 3.2...3.8  
100 s: (3.0...4.0)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40  
2nd speed rpm : 450  
travel mm : 2.80...3.10  
3rd speed rpm : 850  
travel mm : 6.20...6.40  
4th speed rpm : 1000  
travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1110  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 900  
Del.quantity : 181.0...183.0  
1000 : (178.0...186.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360

M10

Rack travel in m: 11.50...11.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (142.0...150.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b  
 Edition : 07.02.89  
 Replaces : 8.4.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 821  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-1K  
 Governor no. : 0 421 815 178

Customer-spec. information  
 Customer : MACK

Engine : E6-300 4VH

1st version kW : 224.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm3/ : 3.2...3.8  
 100 s: (3.0...4.0)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 200.5...202.5  
 1000 : (197.5...205.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 900...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b1  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 822  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RGV325...900PA878-2K  
 Governor no. : 0 421 815 179

Customer-spec. information  
 Customer : MACK

Engine : E6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4 0...4.2  
 Del.quantity cm3/ : 3...3.8  
 100 s: (3.0...4.0)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 236.5...238.5  
 1000 : (233.5...241.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.50  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b2  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 823  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-3K  
 Governor no. : 0 421 815 180

Customer-spec. information  
 Customer : MACK

Engine : EM6-275L 4VH

1st version kW : 202.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm3/ : 3.7...4.3  
 100 s: (3.5...4.5)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1110  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 190.0...192.0  
 1000 : (187.0...195.0)



Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 145.0...149.0  
1000 s: (143.0...151.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b3  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 824  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-4K  
 Governor no. : 0 421 815 181

Customer-spec. information  
 Customer : MACK

Engine : EM6-225L 4VH

1st version kW : 165.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 600  
Rack travel in m: 12.50...12.70  
4th speed rpm : 700  
Rack travel in m: 11.80...12.00  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220

Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm3/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 131.0...135.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 10.00  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b6  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 825  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-5K  
 Governor no. : 0 421 815 182

Customer-spec. information  
 Customer : MACK

Engine : EC6-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm3/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 241.5...243.5  
 1000 : (238.5...246.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 13.60  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 625  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 14.70...14.80  
4th speed rpm : 500  
Rack travel in m: 0.00...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 14.90...15.10

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650

M20

Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 265.0...271.0  
1000 s: (262.0...274.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)  
Rack travel in mm : 8.10...8.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 b4  
Edition : 07.02.89  
Replaces : 7.10.88  
Test oil : ISO-4113

Combination no. : 0 402 746 826

Injection pump  
Pump designation : PES6P120A72ORS7135  
EP type number : 0 412 726 807  
Governor  
Governor design. : RQV325...875PA878-6K  
Governor no. : 0 421 815 183

Customer-spec. information  
Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 2.80...3.20

3rd speed rpm : 850  
travel mm : 6.20...6.40

4th speed rpm : 1000  
travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435

M22

Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 925...935

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 c  
Edition : 07.02.89  
Replaces : 7.10.88  
Test oil : ISO-4113

Combination no. : 0 402 746 827

Injection pump  
Pump designation : PES6P120A720RS7148  
EP type number : 0 412 726 810  
Governor  
Governor design. : RQV325...875PA848-7K  
Governor no. : 0 421 815 176

Customer-spec. information  
Customer : MACK

Engine : EM6 300L 4VH

1st version kW : 224.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 6.00...8.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.5...4.7  
Del.quantity cm3/ : 3.9...4.5  
100 s: (3.7...4.7)

Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 2.50...2.80

3rd speed rpm : 600  
travel mm : 4.10...4.30

4th speed rpm : 875  
travel mm : 7.30...7.50

5th speed rpm : 1000  
travel mm : 8.70...9.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1040  
Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1500



Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.10  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 510  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -

M24

Rack travel in m: 8.30...8.70  
2nd pressure hPa : 370  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 710  
Rack travel in m: 14.40...14.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm3/ : 299.0...305.0  
1000 s: (296.0...308.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 152.5...156.5  
1000 s: (150.5...158.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 d  
Edition : 07.02.89  
Replaces : 7.10.88  
Test oil : ISO-4113

Combination no. : 0 402 746 828

Injection pump  
Pump designation : PES6P120A720RS7148  
EP type number : 0 412 726 810  
Governor  
Governor design. : RQV325...875PA878-7K  
Governor no. : 0 421 815 184

Customer-spec. information  
Customer : MACK

Engine : EM6 300L 4VH

1st version kW : 224.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 6.00...8.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.5...4.7  
Del.quantity cm3/ : 3.9...4.5  
100 s: (3.7...4.7)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40  
2nd speed rpm : 450  
travel mm : 2.50...2.80  
3rd speed rpm : 600  
travel mm : 4.10...4.30  
4th speed rpm : 875  
travel mm : 7.30...7.50  
5th speed rpm : 1000  
travel mm : 8.70...9.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1040  
Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1500

Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.10  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 510  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -

M26

Rack travel in m: 8.30...8.70  
2nd pressure hPa : 370  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 710  
Rack travel in m: 14.40...14.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm3/ : 299.0...305.0  
1000 s: (296.0...308.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 152.5...156.5  
1000 s: (150.5...158.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a7  
 Edition : 07.02.89  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 829

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325..1050PA848-8K  
 Governor no. : 0 421 815 185

Customer-spec. information  
 Customer : MACK

Engine : E6-270 4VH

1st version kW : 201.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del. quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del. quantity cm3/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 800  
 travel mm : 4.80...5.00

4th speed rpm : 1050  
 travel mm : 7.30...7.60

5th speed rpm : 1200  
 travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1210

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 174.0...176.0  
1000 : (171.0...179.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...600

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 630  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 925  
Rack travel in m: 11.90...12.10  
4th speed rpm : 800  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 630  
Pressure hPa : 900  
Rack travel mm : 12.00...12.10

Measurement  
Speed 1/min : 630

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 270

Rack travel in m: 9.60...9.70  
3rd pressure hPa : 400  
Rack travel in m: 11.00...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 630  
Del.quantity cm<sup>3</sup>/ : 192.0...198.0  
1000 s: (189.0...201.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 129.0...133.0  
1000 s: (127.0...135.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a8  
Edition : 10.02.89  
Replaces : 6.4.88  
Test oil : ISO-4113

Combination no. : 0 402 746 832

Injection pump  
Pump designation : PES6P120A72ORS7135  
EP type number : 0 412 726 807  
Governor  
Governor design. : RQV325...900PA848-10  
K  
Governor no. : 0 421 815 189

Customer-spec. information  
Customer : MACK

Engine : EM6 275 2VH

1st version kW : 202.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 18.7...18.9

100 s: (18.4...19.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.6...4.8  
Del.quantity cm3/ : 3.7...4.3  
100 s: (3.5...4.5)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40  
2nd speed rpm : 450  
travel mm : 3.10...3.30  
3rd speed rpm : 850  
travel mm : 5.90...6.10  
4th speed rpm : 1000  
travel mm : 7.50...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1120  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 900

Del.quantity : 187.0...189.0  
1000 : (184.0...192.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.30  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...480

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 540  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 700  
Rack travel in m: 12.70...12.90  
4th speed rpm : 450  
Rack travel in m: 0.00...13.50

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 540  
Pressure hPa : 900  
Rack travel mm : 13.40...13.60

#### Measurement

Speed 1/min : 540

1st pressure hPa : -  
Rack travel in m: 9.00...9.40  
2nd pressure hPa : 320

Rack travel in m: 10.20...10.30  
3rd pressure hPa : 550  
Rack travel in m: 12.00...12.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 540  
Del.quantity cm3/ : 239.0...247.0  
1000 s: (237.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...190.0  
1000 s: (140.0...200.0)  
Rack travel in mm : 9.00...9.40

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a9  
Edition : 10.02.89  
Replaces : 7.10.88  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 833  
  
Injection pump  
Pump designation : PES6P120A720RS7135  
EP type number : 0 412 726 807  
Governor  
Governor design. : RQV325...975PA848-11  
K  
Governor no. : 0 421 815 190

Customer-spec. information  
Customer : MACK

Engine : E6-350 2VH

1st version kW : 257.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 14.10...14.20

Del.quantity cm3/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.5...4.7  
Del.quantity cm3/ : 3.8...4.4  
100 s: (3.6...4.6)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 2.50...2.80  
3rd speed rpm : 800  
travel mm : 4.80...5.00  
4th speed rpm : 1050  
travel mm : 7.30...7.60  
5th speed rpm : 1200  
travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1190  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 975



Aneroid pressure h: 900  
Del.quantity : 230.5...232.5  
1000 : (227.5...235.5)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...600

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 14.10...14.20  
2nd speed rpm : 700  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 600  
Rack travel in m: 0.00...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 700  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 240  
Rack travel in m: 9.30...9.40

3rd pressure hPa : 510  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 237.0...233.0  
1000 s: (224.0...236.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...150.0  
1000 s: (100.0...160.0)  
Rack travel in mm : 7.80...8.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 9,5 e  
Edition : 24.02.89  
Replaces : 30.9.88  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 834  
  
Injection pump  
Pump designation : PES6P120A720RS7154  
EP type number : 0 412 726 811  
Governor  
Governor design. : RQV275...1100PA888K  
Governor no. : 0 421 815 191

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8460.41.102

1st version kW : 235.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 3.10...3.90

3rd speed rpm : 800  
travel mm : 6.30...6.70

4th speed rpm : 1100  
travel mm : 9.70...9.90

5th speed rpm : 1200  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 53...61

#### Testing:

1st rack travel in: 10.60  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 280...400

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 1100  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 950  
Rack travel in m: 11.90...12.10  
4th speed rpm : 750  
Rack travel in m: 11.80...12.00  
5th speed rpm : 400  
Rack travel in m: 11.20...11.40

#### Aneroid/Altitude

##### Compensator Test

#### 1st version

##### Setting

Speed rpm : 850  
Pressure hPa : 1200  
Rack travel mm : 12.00...12.10

##### Measurement

Speed 1/min : 850

1st pressure hPa : -

Rack travel in m: 9.00...9.20  
2nd pressure hPa : 515  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 305  
Rack travel in m: 9.70...9.90

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 196.0...202.0  
1000 s: (193.0...205.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 127.0...129.0  
1000 s: (124.0...132.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack travel: 10.60  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...150.0  
1000 s: (116.0...154.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 12,2 d  
Edition : 07.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 746 835

Injection pump  
Pump designation : PES6P120A320RS7156  
EP type number : 0 412 726 813  
Governor  
Governor design. : RQV250..1050PA793-2  
Governor no. : 0 421 813 699

Customer-spec. information  
Customer : PERKINS

Engine : EAGLE TX

1st version kW : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.30

2nd speed rpm : 350

travel mm : 2.90...3.50

3rd speed rpm : 700

travel mm : 4.00...4.60

4th speed rpm : 1000

travel mm : 7.40...7.60

5th speed rpm : 1100

travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1070

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 277.0...279.0  
1000 : (274.0...282.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 51...59

#### Testing:

1st rack travel in: 13.20  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 17...25

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

#### CONSTANT REGULATION

Speed rpm : 250...570

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.20...14.30

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.20...12.30  
2nd pressure hPa : 850  
Rack travel in m: 13.80...13.90  
3rd pressure hPa : 610  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 170 (190)

#### BREAKAWAY

#### 1st version

NO8

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 746 836

Injection pump  
Pump designation : PES6P120A720RS7157  
EP type number : 0 412 726 814  
Governor  
Governor design. : RQV325...900PA848-12  
K  
Governor no. : 0 421 815 192

Customer-spec. information  
Customer : MACK

Engine : E7-400 4VH

1st version kW : 298.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  
Rack travel in mm : 15.50...15.60  
Del. quantity cm<sup>3</sup>/ : 27.2...27.4  
100 s: (26.9...27.7)  
Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.9...5.1  
Del. quantity cm<sup>3</sup>/ : 4.3...4.9  
100 s: (4.1...5.1)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.30...1.60  
2nd speed rpm : 500  
travel mm : 3.40...4.00  
3rd speed rpm : 900  
travel mm : 6.70...6.90  
4th speed rpm : 1075  
travel mm : 8.40...8.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1120  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200

Del.quantity : 272.0...274.0  
1000 : (269.0...277.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 14.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 625  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 225  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 770

N10

Rack travel in m: 13.80...14.20

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 309.0...315.0  
1000 s: (306.0...318.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 43.0...49.0  
1000 s: (41.0...51.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a1  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 837  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA848-15  
 K  
 Governor no. : 0 421 815 193

Customer-spec. information  
 Customer : MACK

Engine : E7-350 4VH

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 22.8...23.0

100 s: (22.5...23.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm3/ : 4.1...4.7  
 100 s: (3.9...4.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900



Del.quantity : 228.0...230.0  
1000 : (225.0...233.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.80  
Speed rpm : 325  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 500  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 900  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 225  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 545

Rack travel in m: 12.70...13.10

#### START CUT-OUT

Speed 1/min : 265 (275)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 260.0...266.0  
1000 s: (257.0...269.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 950...960

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.40...10.80

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a2  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 838  
  
Injection pump  
Pump designation : PES6P120A720RS7157  
EP type number : 0 412 726 814  
Governor  
Governor design. : RQV325...875PA848-14  
K  
Governor no. : 0 421 815 194

Customer-spec. information  
Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

N13

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 17.3...17.5  
100 s: (17.0...17.8)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.7...4.9  
Del.quantity cm3/ : 4.1...4.7  
100 s: (3.9...4.9)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.30...1.60  
2nd speed rpm : 500  
travel mm : 3.40...4.00  
3rd speed rpm : 900  
travel mm : 6.70...6.90  
4th speed rpm : 1075  
travel mm : 8.40...8.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1120  
Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 900

Del.quantity : 173.0...175.0  
1000 : (170.0...178.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.30  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 510  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 450  
Rack travel in m: 0.00...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 11.90...12.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 205  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 400

N14

Rack travel in m: 11.00...11.40

#### START CUT-OUT

Speed 1/min : 265 (275)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm3/ : 244.0...250.0  
1000 s: (241.0...253.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 168.0...172.0  
1000 s: (166.0...174.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 b  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 839  
 Injection pump  
 Pump designation : PES6P120A720RS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA848-19  
 K  
 Governor no. : 0 421 815 199

Customer-spec. information  
 Customer : MACK

Engine : EM7 300L 4VH

1st version kW : 224.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 21.0...21.2

100 s: (20.7...21.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 4.1...4.7

100 s: (3.9...4.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.50...2.80

3rd speed rpm : 600

travel mm : 4.10...4.30

4th speed rpm : 875

travel mm : 7.30...7.50

5th speed rpm : 1000

travel mm : 8.70...9.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1030

Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200  
Del.quantity : 210.0...212.0  
1000 : (207.0...215.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.50  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 510  
Rack travel in m: 16.00...16.20  
3rd speed rpm : 800  
Rack travel in m: 12.00...12.20  
4th speed rpm : 600  
Rack travel in m: 15.10...15.30  
5th speed rpm : 450  
Rack travel in m: 0.00...15.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.00...16.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 325  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 815  
Rack travel in m: 14.30...14.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 294.0...300.0  
1000 s: (291.0...303.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 165.0...185.0  
1000 s: (155.0...195.0)  
Rack travel in mm : 8.70...9.10

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a12  
 Edition : 10.02.89  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 840  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-18  
 K  
 Governor no. : 0 421 815 198

Customer-spec. information  
 Customer : MACK

Engine : EMC6 250L 4VH

1st version kW : 187.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

N17

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 17.3...17.5

100 s: (17.0...17.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 173.0...175.0  
1000 : (170.0...178.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 10.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 510  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 700  
Rack travel in m: 12.00...12.20  
4th speed rpm : 450  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.30

#### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.10...9.50  
2nd pressure hPa : 215

Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 239.0...245.0  
1000 s: (236.0...248.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.10...9.50

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 12,0 a2  
Edition : 03.03.89  
Replaces : 9.9.88  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 841  
  
Injection pump  
Pump designation : PES6P120A720LS7114-2  
EP type number : 0 412 726 815  
Governor  
Governor design. : RQ300/1050PA774-3  
Governor no. : 0 421 801 451

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM447 LA

1st version kW : 265.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.20

Del.quantity cm3/ : 22.9...23.1  
100 s: (22.6...23.4)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.8...6.2  
Del.quantity cm3/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1500  
Del.quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0



#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 14.00...14.20  
3rd speed rpm : 700  
Rack travel in m: 14.70...14.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 14.00...14.20

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 500  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1100  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1500  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 10.40...10.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 700  
Del.quantity cm3/ : 246.0...249.0  
1000 s: (243.0...252.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

#### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 e  
Edition : 10.02.89  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 746 842  
Injection pump  
Pump designation : PES6P120A720RS7164  
EP type number : 0 412 726 816  
Governor  
Governor design. : RQV325...875PA848-17  
K  
Governor no. : 0 421 815 200

Customer-spec. information  
Customer : MACK

Engine : EMC6 300L 4VH

1st version kW : 200.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
(2.70...2.90)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 14.60...14.70

Del.quantity cm3/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.3...4.5  
Del.quantity cm3/ : 3.9...4.5  
100 s: (3.7...4.7)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40  
2nd speed rpm : 450  
travel mm : 3.00...3.40  
3rd speed rpm : 850  
travel mm : 5.90...6.10  
4th speed rpm : 1000  
travel mm : 7.40...7.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1120  
Rack travel in mm : 7.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1200

Del.quantity : 219.0...221.0  
1000 : (216.0...224.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 13.60  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1160  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.80  
Speed rpm : 325  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.60...14.70  
2nd speed rpm : 510  
Rack travel in m: 16.70...16.90  
3rd speed rpm : 700  
Rack travel in m: 15.30...15.50  
4th speed rpm : 600  
Rack travel in m: 16.00...16.20  
5th speed rpm : 420  
Rack travel in m: 0.00...16.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.70...16.90

Measurement  
Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 10.40...10.80  
2nd pressure hPa : 375  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 735  
Rack travel in m: 15.10...15.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 304.0...310.0  
1000 s: (301.0...313.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 10.40...10.80

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.30...4.50  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 12,2 e  
Edition : 27.10.88  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 746 844  
Injection pump  
Pump designation : PES6P120A720RS7162  
EP type number : 0 412 726 819  
Governor  
Governor design. : RQ750PA836-1  
Governor no. : 0 421 801 454

Customer-spec. information  
Customer : PERKINS

Engine : 2006 TAG

1st version kW : 280.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 37.9...38.1

100 s: (37.6...38.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 3.8...4.4

100 s: (3.5...4.7)

Spread cm3 : 0.8

100 s: (1.2)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 379.0...381.0

1000 : (376.0...384.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Testing:

1st rack travel in: 12.00

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 785...795

4th rack travel in: 820

Speed rpm : 0.00...1.00

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 300.0...340.0  
1000 s: (296.0...344.0)

Remarks:

:

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 16,0 a  
Edition : 17.02.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 748 802

Injection pump  
Pump designation : PES8P120A920/4LS7159  
EP type number : 0 412 728 801  
Governor  
Governor design. : RQV325..1050PA848-21  
K  
Governor no. : 0 421 815 201

Customer-spec. information  
Customer : MACK

Engine : EE9 502

1st version kW : 368.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 7- 8- 4- 5-  
6- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 630

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 21.5...21.7  
100 s: (21.2...22.0)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 4.0...4.6  
100 s: (3.8...4.8)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.30...1.60  
2nd speed rpm : 450  
travel mm : 2.30...2.70  
3rd speed rpm : 800  
travel mm : 4.40...4.80  
4th speed rpm : 1050  
travel mm : 6.90...7.10  
5th speed rpm : 1200  
travel mm : 8.90...9.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degrée: -1  
Speed rpm : 1220  
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 630  
Aneroid pressure h: 1200  
Del.quantity : 215.0...217.0  
1000 : (212.0...220.0)  
Spread cm3 : 5.00  
1000 : (9.00)

### RATED SPEED

#### 1st version

Control lever  
position degrees: 57...65

#### Testing:

1st rack travel in: 12.40  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 9...17

#### Testing:

Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

### CONSTANT REGULATION

Speed rpm : 325...600

### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 630  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1050  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.60

### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1050  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

#### Measurement

Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 8.70...9.10

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2nd pressure hPa : 345  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 725  
Rack travel in m: 12.30...12.70

### START CUT-OUT

Speed 1/min : 280 (290)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 206.0...212.0  
1000 s: (203.0...215.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 161.0...165.0  
1000 s: (159.0...167.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1095...1105

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 9.60...10.00

### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 10,0 p  
Edition : 03.03.89  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 775 800

Injection pump  
Pump designation : PES5P120A720LS7171  
EP type number : 0 412 725 804  
Governor  
Governor design. : RSV350..1050POA529-4  
Governor no. : 0 421 833 319

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM449 A

1st version kW : 184.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness : 6.00X1.50X1000  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 20.9...21.1  
100 s: (20.6...21.4)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 4.5...4.8  
Del.quantity cm3/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 3.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1030  
Aneroid pressure h: 1200  
Del.quantity : 209.0...211.0  
1000 : (206.0...214.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version



Control lever  
position degrees: 50...58

#### Testing:

1st rack travel in: 13.40  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.6  
Speed rpm : 350  
Rack travel in mm : 4.50...4.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 850  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 950  
Rack travel in m: 14.60...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 600  
Rack travel mm : 14.00...14.20

#### Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 350  
Rack travel in m: 13.30...13.50  
3rd pressure hPa : 800  
Rack travel in m: 14.20...14.40  
4th pressure hPa : 1200  
Rack travel in m: 14.70...14.90  
5th pressure hPa : -  
Rack travel in m: 11.30...11.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

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Aneroid pressure h: 660  
Speed rpm : 600  
Del.quantity cm3/ : 196.0...199.0  
1000 s: (193.0...202.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 221.0...223.0  
1000 s: (218.0...226.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1080...1090

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

#### Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm